

STUDIES IN THE GENERA LACRYMARIA & PANAEOLOS

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ABSTRACT. The genus *Lacrymaria* Pat. is shown to be fairly widespread in Australia. *Psilocybe asperospora* Cleland is redescribed from recent collections, and transferred to *Lacrymaria* along with several North American species. The following new combinations are made: *L. asperospora* (Cleland) Watling, *L. glareosa* (Favre) Watling, *L. rigidipes* (Peck) Watling, *L. rugocephala* (Atk.) Watling, *L. sepulchralis* (Singer, Smith & Guzmán) Watling and *L. subcinnamomea* (Smith) Watling. *L. glareosa* is recorded for the first time from the British Isles, Norway and United States. The status of *Panaeolus foenisecii* (Pers. ex Fr.) Schroet. is discussed. Two poisonings are noted, one involving *L. glareosa* and the other *P. foenisecii*.

LACRYMARIA

The agaric genus *Lacrymaria* Pat. is based on the following combination of characters: strongly developed cortina which forms a primary innate covering to the entire pileipellis; dark brown to almost black gills which shed a black spore-print; elements of the pileipellis with membranal pigmentation in shades of yellow-brown giving to the pileus in the field a tawny, fulvous or sienna colouration; dark brown basidiospores with complex wall and distinct, tubular, apical extension equipped with a prominent germ-pore; and, at least in some species, cheilocystidia exuding a colourless fluid giving in the field a beaded effect to the gill-margins. The spores are characterised by the possession of a thin, pale-coloured, limiting layer covering very dark verrucae with honey- to colourless material plugged between them. This limiting layer persists even when many of the basidiospores are dispersed. Rarely is the ornament reduced to insignificant verruculae.

The genus is extensively distributed in temperate Europe and North America but there is little information for Australia in the literature. However, whilst visiting various areas of Australia during the early part of 1974 several collections of *Lacrymaria* were made, indicating that the genus is in fact widespread there. The present communication discusses these collections in the light of the re-collection of *Psilocybe asperospora* Cleland which is undoubtedly assignable to the genus *Lacrymaria*. These same collections are compared with material of various related species from north temperate areas.

PSILOCYBE ASPEROSPORA

P. asperospora was described by Cleland (1934) from Australia and has not been recorded since. From Cleland's description of the fungus it appears to be a very distinctive agaric. He writes, "This rather remarkable species seems to be probably a *Psilocybe*. The shaggy pileus, caespitose habit, tall stipe and rough spores which become black make it readily recognisable. Specimens were last obtained in 1917 near the upper end of Long Gully in Mt. Lofty National Park, but though the site where they occurred has been frequently

inspected since, they have not again been found. The gills, though showing a trace of decurrence, are not very broad behind and the species hardly belongs to *Deconica**. Guzmán and Watling (1978), while reviewing the Australian species of *Psilocybe* (Strophariaceae), rejected Cleland's fungus purely on the description as either a species of *Panaeolina* or *Lacrymaria* (= *Psathyrella* sensu Guzmán).

Whilst collecting in New South Wales the present author made three collections which fitted Cleland's description exactly. The material was undoubtedly related to *Lacrymaria velutina* (Pers. ex Fr.) Konrad & Maublanc and possessed all the characters described above for the genus *Lacrymaria*.

Although Singer (1951), Kühner and Romagnesi (1953) and Smith (1972) all place *Lacrymaria velutina* [= *Hypholoma velutina* (Pers. ex Fr., 1821) Kummer, 1871] in *Psathyrella* the present author following Dennis, Orton and Hora (1960) prefers to maintain *Lacrymaria* as an independent, although closely related, genus. Because of this *Psilocybe asperospora* is transferred to *Lacrymaria* and the following information is offered based on fresh collections since unfortunately type material could not be located at AD.

***Lacrymaria asperospora* (Clel.) Watling, comb. nov. Fig. 1A**

Basionym: *Psilocybe asperospora* Clel. in Trans. Proc. Roy. Soc. S. Aust. 58: 212 (1934).

Large, tall, rather fragile, caespitose agaric. *Pileus* conico-convex, slightly gibbous, dark buff to greyish brown, shaggy at first with adpressed, woolly fascicles of fibrils which collapse on the smooth to wrinkled surface below, with age breaking into sections on handling; margin with fringe of woolly fibrils. *Stipe* snapping easily, stout, attenuated upwards, with shaggy fibrils below and apical fringe of fibrils becoming almost black with age; whole stipe finally becoming blotchy. *Gills* adnate, fairly crowded, dark brown, almost black with age. *Flesh* greyish brown, more reddish brown in stipe (not critically recorded). *Basidia* 4-spored, hyaline to slightly yellow in aqueous solutions of alkali, $20 \times 7-8 \mu\text{m}$ (sterigmata to $4 \mu\text{m}$ long). *Basidiospores* amygdaliform to limoniform with a protracted, smooth, tubular region capped with a germ pore, $9-11 \times 6.5-8 \mu\text{m}$, dark blackish brown (umber to vandyke) with coarse, irregularly broad tuberculae or crowded verrucae, fusing into irregular masses and leaving faintly honey-coloured material between; immature spores covered by an obvious pale-coloured membrane. *Pleurocystidia* apparently absent; *cheilocystidia* numerous, elongate-cylindric except for a large clavate or more frequently capitate head, smooth, hyaline or with sparse honey-coloured contents, thin-walled and frequently collapsing, $50-60 \times 7-9 \mu\text{m}$; head $9-11 \mu\text{m}$. *Caulocystidia* numerous in clusters at apex of stipe, hyaline, polymorphic, ovoid to cylindric or distinctly capitate, $19-25 \times 13-15.5 \mu\text{m}$ to $46.5-50 \times 5.5-8 \mu\text{m}$, $9-11 \mu\text{m}$ wide at base. *Hymenial elements* with distinct although diffuse brown pigmentation. *Pileipellis* a palisadoderm of vesiculose cells with pale-coloured walls, several cell-layers deep and up to $42.5 \mu\text{m}$ broad, overlain by filamentous units of veil, sometimes with swollen end-cells reaching $30 \mu\text{m}$ broad.

Around base and in hollowed stump of old *Eucalyptus viminalis* Labill. ? in wet sclerophyll forest; Tidbinbilla Nat. Reserve, New South Wales, 21 iv

* *Deconica* (W. G. Smith) Karst. now synonymised with *Psilocybe*.

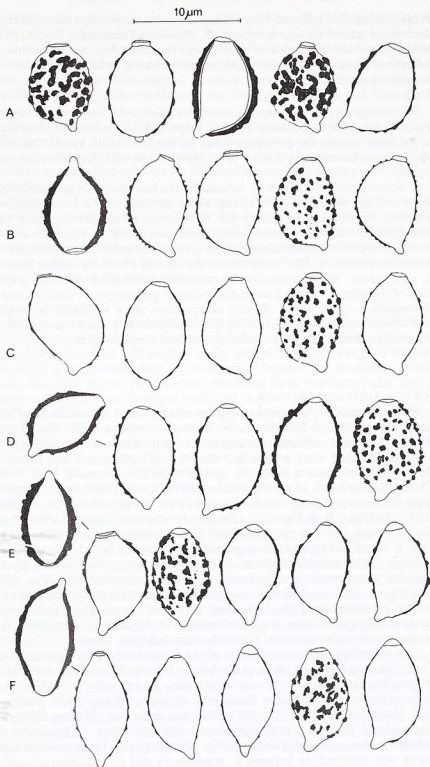


FIG. 1. Australian and Indian *Lacrymaria* spp. compared with *L. velutina*. A, *Lacrymaria asperospora*, Watling 10475; B, *L. cf. rugocephala*, Watling 10213; C, *L. cf. rugocephala*, Watling 10198; D, *L. velutina*, Orton 4168; E, *Lacrymaria* sp., Bhutan, Grierson & Long 553; F, *Lacrymaria* sp., Bhutan, Grierson & Long 578.

1974 (Watling 10475, E) and 26 iv 1974. *L. asperospora* was also recorded from the base of an old *Eucalyptus regnans* F. Muell. in Sherbrooke Forest (30 iv 1974) near Melbourne, Victoria, although material was not retained. A collection from Bulolo, New Guinea undoubtedly belongs here and is considered separately below.

Microscopically *L. asperospora* resembles *Psathyrella sepulchralis* Singer, Smith & Guzmán particularly in spore shape and ornamentation; however, in the latter species the germ-pore takes on the form of an apical "bubble" and is not at the end of a distinct tube. Nevertheless field characters are very similar.

L. asperospora differs from *L. velutina* by the less obviously amygdaliform spore-outline, the more obvious suprahilar depression, the ornamentation generally fused into large, block-like, flat-topped tuberculae (agreeing well with Cleland's mulberry description), the almost black, as opposed to red-brown, spore-wall pigmentation and the accentuated germ-tube at the apex of a tubular extension. The latter species has spores of a very similar size to *L. asperospora*. Macroscopically the caespitose habit, long stipe and greyer hues of the pileus, and the habitat preference of growing on or close to wood distinguish *L. asperospora*. Present observations show strikingly large size and robustness as features of this species, but perhaps a more representative range of collections is really needed to establish these characters.

FURTHER AUSTRALIAN MATERIAL

What appeared to be typical *L. velutina* was found on a roadside in a *Pinus radiata* plantation in New South Wales (near Canberra ATC, Blue Range Block, 25 iv 1974) although microscopic examination was not carried out. Material agreeing macroscopically with the same species was also found in huge troops in Western Australia [near Pemberton, Diamond State Park, Channybearup Road, 14 v 1974, Watling 10198 (E) and Pemberton, Diamond State Park, area at junction of Allis and Power Roads, 15 v 1974, Watling 10213 (E):(Fig. 1B & Fig. 1C)]. The basidiomes were scattered over many yards of track in temperate sclerophyll forest containing *Eucalyptus diversicolor* F. Muell., and many possessed pilei up to 160 mm broad. The spores of Watling 10918 resembled those of *Psathyrella rugocephala* (Atk.) Smith showing pronounced protuberance, yet reduced ornamentation (Fig. 2C). The other collection which macroscopically resembled material found at two further locations along the same road, possessed spores which lacked this pronounced protuberance; the ornamentation in this material was reduced to conical warts with occasional fusion between adjacent verrucae.

Five collections of representatives of the genus *Lacrymaria* were made in Tasmania: near Hobart, fern glade below Mount Wellington, 4 v 1974; Nugent-Buckland area, north east of Hobart, in wet gully, 2 v 1974; and three collections from under *Eucalyptus viminalis*, Mount Field National Park (Russell Falls area), 1 v 1974. Only one collection (Watling 10366, E) was retained for closer examination and was very close to European *L. velutina* in most essential characters (Fig. 1D) except that the spore-ornamentation was intermediate between *L. asperospora* and *L. velutina*.

Psathyrella sepulchralis Singer, Smith and Guzmán, a Mexican agaric referable to the genus *Lacrymaria*, differs from the Australian collections described above in the longer, broader basidiospores with coarser ornamentation which darkens in Melzer's reagent, and in possessing dark-coloured hairs on the pileus. This species, however, apparently occupies similar and parallel ecological niches to those of the Western Australian and Tasmanian taxa.

Although Horak (1971b) indicates that the genus *Lacrymaria* has probably been introduced into New Zealand, this does not seem to be entirely true for Australia. It would appear that at least one species, *L. asperospora*, could be endemic as the collections made in Tidbinbilla were from an area with minimal disturbance.

Perhaps *L. velutina* has entered Australia from Europe during the conifer planting programme, as undoubtedly has been the case with *Suillus luteus* (Linn. ex Fr.) S. F. Gray, *S. granulatus* (Linn. ex. Fr.) O. Kuntze and *Lactarius deliciosus* (Linn. ex Fr.) S. F. Gray. The agaric resembling *Psathyrella rugocephala* noted above may also have gained a foothold in Australia from North America in the same way.

INDIAN MATERIAL

Phytogeographers have indicated that there is a close relationship between certain facets of the Indian and Australian floras; indeed there are pockets of Indo-Malaysian flora still existing in the coastal mountain range of Eastern Australia. Comparisons were therefore made between the Australian collections described above, three recent collections from Northern India, and a single collection from Southern India, all in E.

Two collections from Northern India were from Bhutan and were collected in warm, wet, broad-leaved forests: one from the east side of Dochu La (c. 200 m below pass, 3,000 m, on gravelly road-side bank, 20 vi 1975, Grierson and Long 578, Fig. 1F) and the second from Pele La (3,300m, 19 vi 1975, Grierson and Long 553, Fig. 1E). Both collections agree closely with the Australian Channybearup Road specimens in ornamentation of the basidiospores, although the protruberances on the spores are dark-coloured, slightly shorter and the whole spore-outline more elongate-amygdaliform.

The third northern collection was from Pahlgam, near Srinagar, Kashmir (on pathside in grass, grazed ledge at margin of coniferous woods, 6 x 1978, Watling 13048) and agreed in all essential details with the Bhutan collections. Features uniting all these collections and a single collection from Tasmania (Watling 10366, Fig. 2H) are the basidiospores possessing a distinct suprahilar depression, a germ-pore at the end of a laterally inclined protuberance and the ornamentation composed of verrucae forming irregular longitudinal striae (tuberculate-striate). Although very close to *L. velutina* they differ in minor spore details, the significance of which can only be ascertained by examination of further collections; notes on fresh material are urgently required.

The material from S India, collected by Miss B. Manjula (Kodai Kanal, 24 vii 1977, Watling 13117, E and Madras) is much smaller in stature than *L. asperospora* but the basidiospores are very similar in morphology. Miss Manjula intends to describe the material in detail but the record indicates that *Lacrymaria* is to be found in at least two major areas of the Indian subcontinent.

NEW GUINEA & NEW ZEALAND COLLECTIONS

Egon Horak has been kind enough to loan me material of two agarics collected by him in Papua New Guinea and one from New Zealand. All three are referable to the genus *Lacrymaria* and two appear to be new species; the third undoubtedly is closely allied, if not conspecific, with *Lacrymaria asperospora*. The last collection was found at Bulolo (29 xi 1971, ZH 71/338) and apparently differs from *L. asperospora* only in the slightly narrower spores.

The other collection from New Guinea is separable in both macro- and microscopic characters from *L. asperospora* and other known species. It was found on soil in a wood at Oomsis Markham Valley (4 vii 1972, 72/513, legit R. Johns). It has almost subglobose basidiospores with large polygonal warts and subcapitate to almost elongate-clavate cheilocystidia. The gills are also quite pale in the dried condition, resembling those of *Psathyrella candolleana* (Fries) Maire. It is hoped to obtain more material of this new agaric for formal description in the future.

The above mentioned collections indicate that very probably *Lacrymaria* is indigenous to New Guinea and coupled with the information from Australia might suggest that Horak's proposal that *Lacrymaria* has probably been introduced into New Zealand may need modification. There is every possibility that *L. velutina* could have been introduced from Europe into New Zealand in a similar way to that proposed above for other species in Australia. However the presence of at least one quite distinct taxon in New Zealand warrants further investigation. The collection, (under *Nothofagus cliffortioides* Oerst., Harry Creek, South Island, 3 iv 1969, ZH 69/220) has both a fibrillose scaly pileus and stipe and long distinctly capitate cheilocystidia. The basidiospores are similar to those of European *L. velutina*, some of the Western Australian material described above and also those figured by Horak (1971a) for the type of *Stropharia leiotioides* Cooke & Massee, which undoubtedly is a species of *Lacrymaria*.

EUROPEAN & NORTH AMERICAN COLLECTIONS

During examination of Australian collections it has been found necessary to compare them critically with European and North American agarics with similar spore morphology. It was found that even the European material could be split into two quite distinct entities: typical *L. velutina* possessing heavily and discretely verrucose spores which possessed a short, coloured protuberance with inner wall ballooning out, and a second taxon with much less heavily ornamented spores but with a more distinct suprahilar depression (Fig. 2, D & G). Collections of the latter were smaller than typical *L. velutina* and grew amongst grass in gardens or on roadsides. The material agrees in all ways with that for *Drosophila glareosa* Favre described from the Swiss Alps, (non *Psathyra glareosa* Berk. & Br., *Notices on British Fungi*, entry 2011, 1882). One might even hazard the suggestion judging from the illustration alone that *L. lacrymabunda* f. *gracillima* Lange from Denmark, usually considered a synonym of *L. velutina*, is really Favre's fungus, although microscopic examination of fresh collections is really required. Apparently the present records (see p. 378) are the first for this taxon from the British Isles, Norway and United States. *Drosophila glareosa* is very close to the

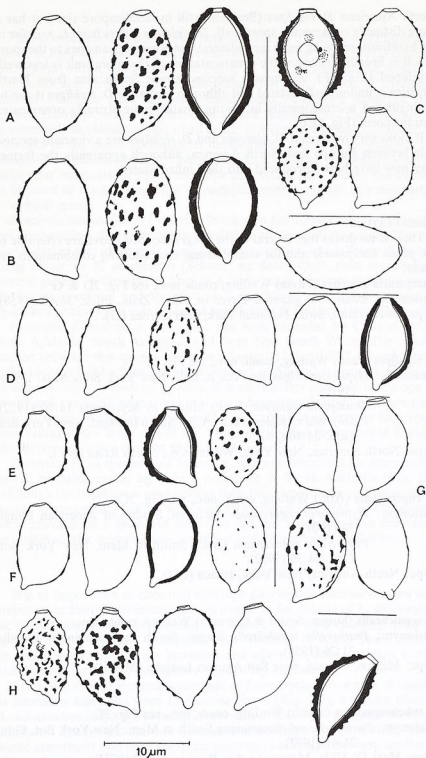


FIG. 2. Australian and North Temperate *Lacrymaria* spp. and *Panaeolus foeniseccii*. A, *Panaeolus foeniseccii*, Europe, Watling 322C; B, *P. foeniseccii*, S Australia (AD); C, *Lacrymaria rugocephala*, U.S., Watling 1360/1660C; D, *L. glareosa* from Scottish poisoning, E, *L. subcinnamomea*, U.S., Watling 1469A/1742C; F, *L. rigidipes*, Canada, Watling 3674; G, *L. glareosa*, Scotland, Watling 1049C; H, *Lacrymaria* cf. *velutina*, Australia, Watling 10366.

North American *D. rigidipes* (Peck) Murrill in basidiospore size but has a more distinctly ornamented spore-wall. *D. rigidipes* differs from *L. velutina* in the basidiospores being more inequilateral and possessing an apex to the spore which is broadly truncate; the ornamentation of the spore-wall is less well-developed (Fig. 2F). *Psathyrella subcinnamomea* Smith also from North America is undoubtedly related and although similar to *D. rigidipes* it can be distinguished microscopically in having smaller more strongly ornamented basidiospores (Fig. 2E).

It looks very much as if *D. glareosa* and *D. rigidipes* are a vicariant species-pair between Europe and North America, although apparently the former may now have been introduced into the United States.

NOMENCLATURE

There is no doubt that several of the fungi described above are referable to the genus *Lacrymaria* and for completeness the following combinations are made:—

Lacrymaria glareosa (Favre) Watling, **comb. nov.**, see Fig. 2D & G

Basionym: *Drosophila glareosa* Favre in Schw. Zeits. Pilzk. 36:69 (1958).

Type: Switzerland, Swiss National Park, near Zerneze (G).

L. rigidipes (Peck) Watling, **comb. nov.**, see Fig. 2F

Basionym: *Hypholoma rigidipes* Peck in Bull. New York State Mus. 139:24 (1910).

Drosophila rigidipes (Peck) Murrill in Mycologia 14:70 (1922).

Psathyrella rigidipes (Peck) A. H. Smith in Mem. New York Bot. Gdn. 24:40 (1972).

Type: North America, New York, Warren Co., North River (NY).

L. rugocephala (Atk.) Watling, **comb. nov.**, see Fig. 2C

Basionym: *Hypholoma rugocephala* Atkinson, Studies of American Fungi: 30 (1901).

Psathyrella rugocephala (Atk.) Smith in Mem. New York Bot. Gdn. 24:39 (1972).

Type: North America, New York, Ithaca (CU).

L. sepulchralis (Singer, Smith & Guzmán) Watling, **comb. nov.**

Basionym: *Psathyrella sepulchralis* Singer, Smith & Guzmán in Lloydia 21:26 (1958).

Type: Mexico, Oaxaca, near San Agustín Loxicha (MICH).

L. subcinnamomea (Smith) Watling, **comb. nov.**, see Fig. 2E

Basionym: *Psathyrella subcinnamomea* Smith in Mem. New York Bot. Gdn. 24:41 (1972).

Type: Heat O' Hills, Mount Angles, Washington (MICH).

PANAEOLUS

Panaeolus foenisecii (Pers. ex Fr.) Schroet. was for a long time traditionally placed in *Psilocybe*; more recently it has been placed by Smith (1972) close to *Lacrymaria* within the genus *Psathyrella*, in part because of the similarly pigmented and ornamented basidiospores. The same character probably induced Maire to erect the independent genus *Panaeolina* based on this species. However, other than the ornamented basidiospores there is little to recommend the placing of this small agaric in a separate genus. In parallel to members of the genus *Panaeolus* its development is paravelangiocarpic, the pileipellis is a palisadoderm and pleurocystidia are absent. *Panaeolus foenisecii* lacks velar remnants on pileus and stipe and except for the dark red-brown, as opposed to black, spore-print it resembles members of the *P. acuminatus*-*P. rickenii* group.

Panaeolus castaneifolius (Murrill) Smith also has roughened basidiospores but they are less distinctly ornamented than those of *P. foenisecii*. There is also a darker spored taxon lacking formal description which draws these two fungi closer to *P. acuminatus* (Schaeff. ex Secr.) Quél. than ever before. Several genera in the agarics possess a wide range of spore-print colour in the brown spectrum and therefore it is considered that the differences in spore-morphology and colour should not exclude *P. foenisecii* from *Panaeolus*.

Panaeolus foenisecii, as *Psilocybe*, has been recorded by Cleland (1934) from Adelaide, South Australia, and from New South Wales. The present author collected this species in Western Australia (Wat. 10232, E) and there is little doubt it will be found to be widespread in Australia, growing especially in areas strongly influenced by man. It is particularly common in Europe on lawns and road-side verges and may even have been introduced from there into Australia. Although Cleland notes his Australian collections have spore sizes falling at the lower end of the range accepted for the species in Europe, this difference is not thought to be significant.

Material of this species now housed at AD was submitted for examination as the probable causal agent in a poisoning in South Australia (Fig. 2B). Although the basidiomes were smaller than European specimens, the material agrees microscopically in all ways with *P. foenisecii* (Fig. 2A). The specimens were growing on a lawn but field data did not accompany the collection; nevertheless the material was identified with reasonable confidence.

CASES OF POISONING

It is of importance to note that although *Lacrymaria velutina* is eaten with impunity in Europe no information is available for the use of *L. asperospora* or related taxa as food in Australia, or indeed as to their edibility. With the great influx of southern Europeans into Australia in recent years, interest in eating native agarics has increased and often too little attention is paid there to the identity of the agarics before they are eaten.

Thus with the widespread occurrence of *Lacrymaria* spp. a note of caution is necessary especially since *L. glareosa* Favre (Fig. 2D), a species close to *L. velutina* was suspected as being involved in a case of poisoning in Aberdeen, Scotland. The patient showed symptoms of cardiac excitement, followed by some arrestment and then complete recovery, i.e. symptoms very similar to those of poisoning by *Panaeolus foenisecii*.

Lacrymaria sepulchralis, which is believed to be close to *L. velutina* and its allies, has been reported as hallucinogenic by Zapotec Indians in Mexico but Singer et al. (1958) consider this is because of confusion with other dark-spored hallucinogenic agarics. This suggestion is supported by the fact that in the neighbouring Maxotec region of Mexico *L. sepulchralis* is not considered hallucinogenic.

Robbers, Tyler and Ola'h (1969) have isolated the psychomimetic chemical, psilocybin (a compound which induces distress symptoms) from some collections of *P. foenisecii*. Southcott (1975) describes the case history of the poisoning of a small child in South Australia, implicating the collection of *P. foenisecii* noted earlier (p. 377). This case substantiates Holden's suspected poisoning of a three-year old child in Britain (1964) by the same fungus. Because of its widespread distribution, and its frequency on lawns and in parks, *P. foenisecii* is likely to cause poisonings especially of young children; it is frequently featured in manuals on hallucinogenic fungi.

EUROPEAN & AMERICAN MATERIAL EXAMINED

All Australasian and Indian collections are cited in the main text. Collections are in E except where indicated.

Panaeolus foenisecii

EUROPE. **England & Scotland:** Durham, Spennymoor, on lawn, 25 vii 1962, *Watling* 434c; Lancashire, Freshfield, 10 vii 1957, *Orton* 1311; Yorkshire, Great Clough, Colden Valley, amongst grass, 6 viii 1958, *Watling* 148c; Midlothian and East Lothian, Aberlady, in fixed sand-dune, 1 vii 1971, *Ballantyne* 44; Balerno, grassy roadside margins, 19 ix 1955, *Henderson* 2297; several collections 1953-1971, Royal Botanic Garden and Inverleith Park, Edinburgh, *Ballantyne* 51, *Henderson* 788, *Watling* 322c, 325c, 679c, etc. **Finland:** Lammi, nr Rant a Koiva, in field, 19 viii 1971, *Watling* 8353. **Switzerland:** nr Filisur, grassy area, 1500 m, 27 viii 1971, *Watling* 8245.

N AMERICA. Idaho, Bonner Co., Barnard Creek, on roadside, 12 ix 1966, *Watling* 3045; Michigan, Washtenaw Co., Ann Arbor, on lawn, 1 ix 1965, *Watling* 1423A/1703C.

Lacrymaria glareosa

EUROPE. **Norway:** Finnmark, Karlebotn, on roadside in grassy area, 29 viii 1973, *Watling* 9552. **Scotland:** Edinburgh, on newly sown lawn, 22 x 1964, *Watling* 1049c; Aberdeen, on lawn, 7 x 1975, 3 collections.

N AMERICA. Michigan, Washtenaw Co., Ann Arbor, in grass under *Quercus* in newly graded area, 6 ix 1965, *Watling* 1473A/1746C; *ibid.*, in drive amongst gravel, 4 x 1969, *Watling* 6990.

L. rigidipes

N AMERICA. **Canada:** British Columbia, nr Kokanee, Nelson, on logging path, 3 x 1966, *Watling* 3674. **U.S.A.:** Idaho, Bonner Co., Benton Creek Road, Priest River Exp. Station, on roadside, 12 ix 1966, *Watling* 2980.

L. rugocephala

N AMERICA. Michigan, Jackson Co., Winna Wonna Lake, 2 ix 1965, by pathside, ex A. H. Smith, *Watling* 1360A/1660C (Fig. 2C).

L. sepulchralis

C AMERICA. Mexico: Oaxaca near San Agustin Loxicha, 14 x 1957, *Guzmán* SA-1140 (MICH).

L. cf. subcinnamomea

N AMERICA. Michigan, Jackson Co., Waterloo Recreation area, 6 ix 1965, on roadside, *Watling* 1469A/1742C.

L. velutina

EUROPE. **England & Scotland:** Norfolk, Hedenham Wd, 24 x 1971, *Orton* 4168 (Fig. 1D); Yorkshire, Bishop Wd, 26 ix 1971, pathside in mixed woodland, *Watling* 8991; Midlothian, Edinburgh, Royal Bot. Gdn, 9 vi 1974, ex J. A. Ratter, *Watling* 11107; Sutherland, Strathmore, 19 ix 1972, in old limestone quarry on muddy soil, *Watling* 9365. **Finland:** Ruissalo, nr Turku, 24 viii 1971, on pathside, *Watling* 8374. **Germany:** nr Sonnerwalde, vii 1845, ex Kritschmar, Herb. W. Evans.

N AMERICA. Maryland, Catoctin Mountain Park, Thurmont, 12 x 1969, roadside nr parking lot, ex H. Burdsall, *Watling* 6223 (as *Ps. rigidipes*)—2 collections; Michigan, Jackson Co., Winna Wonna Lake, 2 ix 1965, on old stump, ex A. H. Smith, *Watling* 1368A/1668C.

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and Inverleith Park,
etc. **Finland:** Lammi,
r Filisur, grassy area,

1966, *Watling* 3045;
1423A/1703C.

29 viii 1973, *Watling*
1049c; Aberdeen, on

er *Quercus* in newly
gst gravel, 4 x 1969,

egging path, 3 x 1966,
st River Exp. Station,

by pathside, ex A. H.

57, Guzmán SA-1140