

CHAPTER 8

FAMILY HAEMATOMMATACEAE

Characteristics of the Family Haematommataceae

Thallus: corticolous and/or saxicolous, white to cream-colored, yellow-grey or pale grey, smooth and slightly warty, rimose or areolate; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, orange-red to red-brown and concolorous at margin; epruina; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red; Hymenium: hyaline; Subhymenium: indistinct; Hypothecium hyaline; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen; Asci: clavate, *Lecanora*-type; **Ascospores**: 4 or 8 per ascus, hyaline, fusiform, straight or slightly curved, transeptate (5-15-septated) or submuriform; **Pycnidia** and **Conidia** not observed.

Description of the Genus *Haematomma*

Haematomma A. Massal., *Ric. Auton. Lich. Crost.* 32 (1852) (Staiger, Kalb & Ryan, 2004, p. 128).

Thallus: corticolous and/or saxicolous, white to cream-colored, yellow-grey or pale grey, smooth and slightly warty, rimose or areolate, 150.8-277.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, orange-red to red-brown and concolorous at margin; epruina, 0.5-2.1 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 μm thick; Hymenium: hyaline, 60.0-110.0 μm high; Subhymenium: indistinct; Hypothecium hyaline, 77.9-155.8 μm high; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen, 31.5-38.9 μm high; Asci: clavate, *Lecanora*-type, 4.0-6.5 μm high; **Ascospores**: 4 or 8 per ascus, hyaline, fusiform, straight or slightly curved, transeptate (5-15-septated) or submuriform, (51.4)51.6-69.6-87.8(94.6) \times (6.45)6.0-7.8-9.1(9.4) μm ; **Pycnidia** and **Conidia** not observed.

Chemistry: Atranorin, haematommone, isosphaeric acid, isoplacodiolic acid, placodiolic acid, russulone and sphaerophorin.

Habitat: on bark and rock.

Distribution: United States, Costa Rica, Europe, Western Australia, and Australia.

Key to Species of Haematomma

- 1a. Thallus saxicolous.....*Haematomma* cf. *africanum*
- 1b. Thallus corticolous or saxicolous.....2
- 2a. Ascospores submuriform.....*Haematomma wattii*
- 2b. Ascospores fusiform, transversely septate.....3

- 3a. Thallus containing isosphaeric acid..... *Haematomma collatum*
 3b. Thallus lacking isosphaeric acid4
 4a. Ascospores fusiform, 5-7-septate..... *Haematomma flexuosum*
 4b. Ascospores fusiform, 9-15-septate..... *Haematomma* PL.1

Description of the Species

1. *Haematomma* cf. *africanum* (J. Steiner) C. W. Dodge, *Beih. Nova Hedwigia* 38: 39 (1971) (Elix, 2004, pp. 5-6).

Haematomma bubalinum R. W. Rogers, *Lichenologist* 17(3): 308 (1985).

Haematomma puniceum var. *africanum* J. Steiner, *Bull. Herb. Boissier*, sér. 2, 7: 641 (1907).

(see Figure 18)

Thallus: saxicolous, whitish to pale grey, smooth, rimose, 185.0-260.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, cinnabar-red and concolorous at margin; but often appearing pale reddish orange due to a dense yellow pruina, 0.5-2.0 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 µm thick; Hymenium: hyaline, 60.0-100.0 µm high; Subhymenium: indistinct; Hypothecium hyaline, 80.9-150.5 µm high; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen, 30.5-43.7 µm high; Asci: clavate, *Lecanora*-type,

4.0-6.5 μm high; **Ascospores:** 8 per ascus, hyaline, fusiform, straight or slightly curved, transeptate, 9-12-septated, (60.1)60.2-66.6-73.1(77.4) \times (4.3)4.5-5.8-7.3(7.7) μm ; **Pycnidia:** immersed, hyaline ostiole; **Conidia:** hyaline, bacilliform, 6.0-7.0 \times 0.8-1.2 μm .

Chemistry: Thallus P+ yellow, K+ yellow, C-, KC-; disc K+ violet; containing atranorin, haematommone and placodiolic acid.

Habitats: On rocks in dry dipterocarp forests at 700 meter from sea level.

Distribution: Central and South America, Africa, India, Thailand, Malaysia, Philippines, Japan, Papua New Guinea and New Caledonia, Eastern Australia, and Queensland.

Specimens examined: Phu Luang Wildlife Sanctuary, Loei Province. Phu Khon Substation, on rocks, 21 May 2009, Varaporn Sriprang—RU013829(RAMK).

Observation: *Haematomma* cf. *africanum* is characterized by the smooth or weakly rugulose, whitish to greenish grey thallus, sessile apothecia with cinnabar-red discs, 9-12-septate ascospores, short, bacilliform conidia, medullary placodiolic acid and epithelial haematommone. The species is growing on rocks, but as we could not find any anatomical or chemical differences to the normally corticolous specimens, we have tentatively identified our collection with *H. africanum*, awaiting more findings.

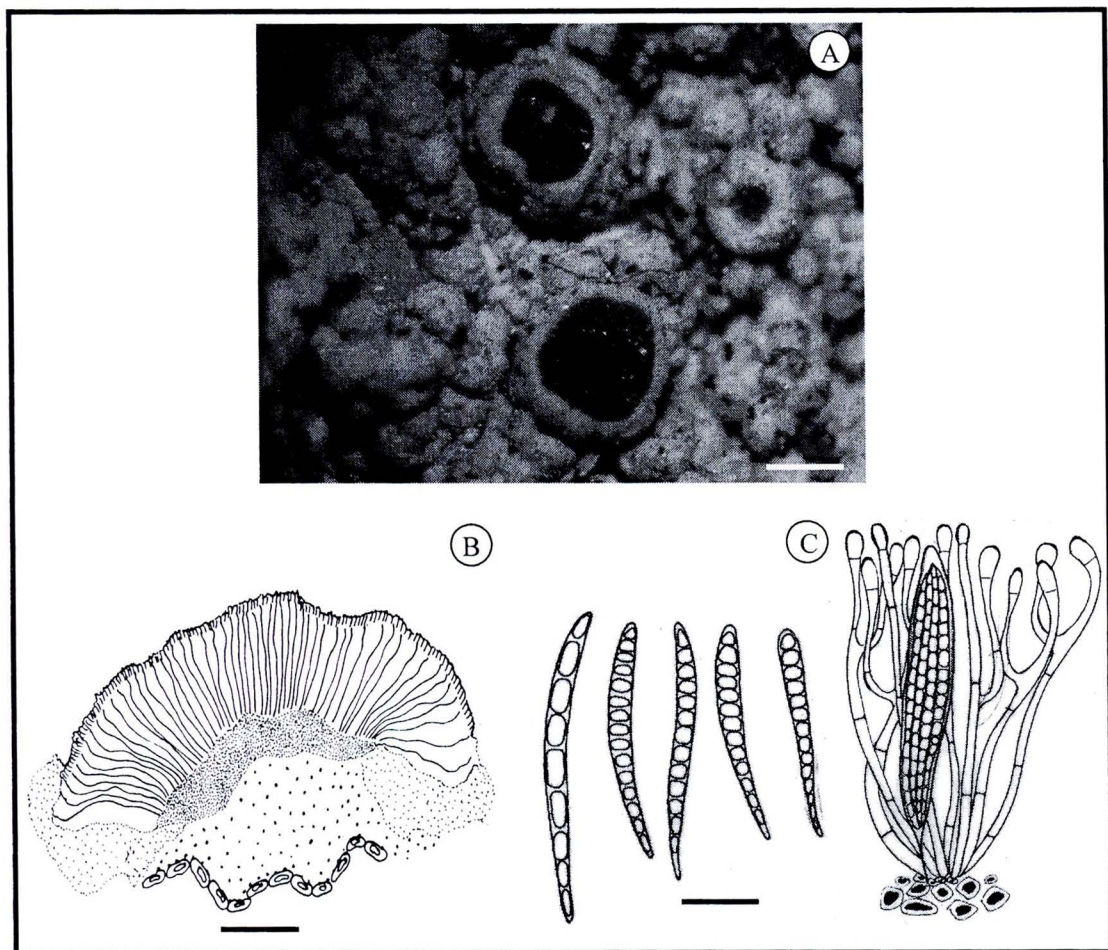


Figure 18 *Haematomma* cf. *africanum* (J. Steiner) C. W. Dodge

Note. A = Apothecia lecanorine, sessile, red [RU013829(RAMK)]

(scale = 2 mm)

B = Illustration of vertical section of apothecia [RU013829(RAMK)]

(scale = 9.07 μ m)

C = Illustration of ascus with paraphyses and ascospores [RU013829

(RAMK)] (scale = 8.40 μ m)

2. *Haematomma collatum* (Stirt.) C. W. Dodge, *Beih. Nova Hedwigia* 38: 41 (1971) (Elix, 2004, p. 6)

Lecanora punicea var. *collata* Stirt., *Trans. Glasgow Soc. Field Naturalists* 5: 216 (1877)

(see Figure 19)

Thallus: corticolous, white to cream-colored or pale grey, smooth, areolate, 155.8-270.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, cinnabar-red to red-brown and concolorous at margin; epruina, 1.0-1.5 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 μm thick; Hymenium: hyaline, 60.0-110.0 μm high; Subhymenium: indistinct; Hypothecium hyaline, 79.4-148.5 μm high; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen, 31.5-42.9 μm high; Asci: clavate, *Lecanora*-type, 4.0-6.5 μm high; **Ascospores**: 8 per ascus, hyaline, fusiform, transeptate, 7-13-septated, (59.6)60.2-63.2-66.7(68.8) \times (4.3)4.6-4.9-5.6(6.02) μm ; **Pycnidia** and **Conidia** not observed.

Chemistry: thallus P+ yellow, K+ yellow, C-, KC+ red; containing atranorin, sphaerophorin, isosphaeric acid and russulone.

Habitats: occurring on barks in lower montane rainforests, lower montane scrub and tropical rainforests at 923-1,487 meter from sea level.

Distribution: Mexico, Columbia, Central and South America, South and East Africa, Sri Lanka, India, Thailand, Indonesia, Papua New Guinea,

Australia, South-eastern Queensland, and north-eastern New South Wales.

Specimens examined: Phu Luang Wildlife Sanctuary, Loei Province.

Head Quarter of Phuluang Wildlife Sanctuary, on trunk of an unidentified tree, 20 May 2009, Varaporn Sriprang—RU013828, MSPL064, VC111, VC112 & VC113(RAMK); *ibid.*, Seven Chanal Station, on trunk of an unidentified tree, 20 August 2005, Sittiporn Panmen and Pornpet Pornphrom—CH281(RAMK); *ibid.*, Khok Phrommachan, on trunk of an unidentified tree, 26 June 2008, Varaporn Sriprang—VC492(RAMK); *ibid.*, Khok Huai Toei, on trunk of an *Quercus lineata* Blume, 27 June 2008, Varaporn Sriprang—VC451 & VC521(RAMK); *ibid.*, Phuluang Wildlife Research Station, on trunk of an unidentified tree, 12 November 2008, Varaporn Sriprang—VC049, VC050, VC655, VC657, VC665, VC667, VC670, VC676, VC701, VC114, VC115, VC116 & VC117(RAMK); *ibid.*, around the helicopter landing spot, on trunk of an unidentified tree, 13 November 2008, Varaporn Sriprang—VC668(RAMK).

Observation: *Haematomma collatum* is characterized by the areolate, cream-colored thallus, sessile apothecia with cinnabar-red discs and markedly crenulated margins, 7-13-septate ascospores, medullary sphaerophorin and epithelial russulone.

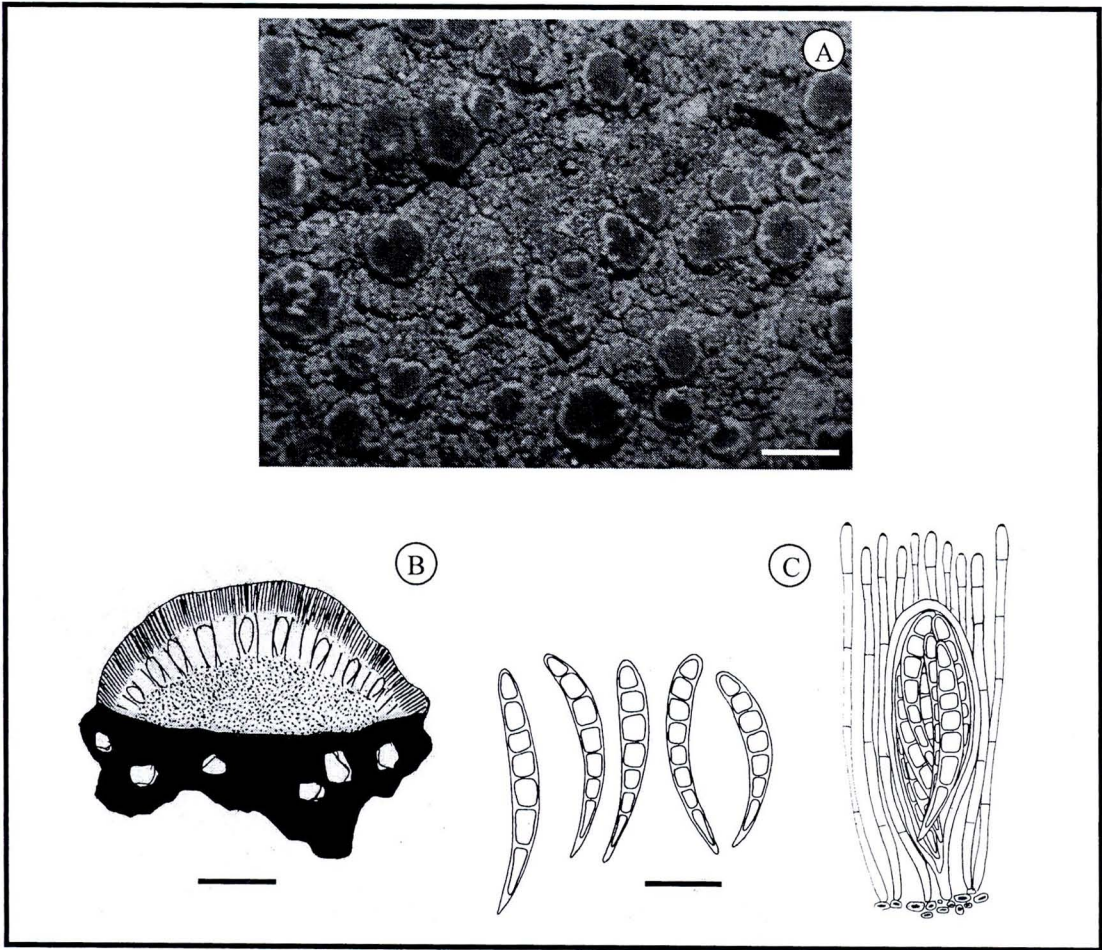


Figure 19 *Haematomma collatum* (Stirt.) C. W. Dodge

Note. A = Apothecia lecanorine, sessile, red to reddish brown

[RU013828(RAMK)] (scale = 1.33 mm)

B = Illustration of vertical section of apothecia [RU013828(RAMK)]

(scale = 14.2 μm)

C = Illustration of ascus with paraphyses and ascospores [RU013828

(RAMK)] (scale = 6.02 μm)

3. *Haematomma flexuosum* Hillm., *Repert. Spec. Nov. Regni Veg.* 49: 35 (1940) (Elix, 2004, p. 7).

(see Figure 20)

Thallus: corticolous, white to cream-colored, yellow-grey or pale grey, smooth and slightly warty, weakly rimose, 157.8-278.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, orange-red to red-brown and concolorous at margin; epruina, 1.0-1.5 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 μm thick; Hymenium: hyaline, 70.0-110.0 μm high; Subhymenium: indistinct; Hypothecium hyaline, 79.9-150.8 μm high; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen, 32.5-40.9 μm high; Asci: clavate, *Lecanora*-type, 4.0-6.5 μm high; **Ascospores**: 8 per ascus, hyaline, fusiform, straight or slightly curved, transeptate, 5-7-septated, (34.4)35.7-43.7-51.8(55.9) \times (3.4)3.6-4.3-5.1(5.3) μm ; **Pycnidia** and **Conidia** not observed.

Chemistry: thallus P+ yellow, K+ yellow, C-, KC-; disc K+ violet; containing atranorin and haematommone.

Habitats: occurring on barks in lower montane rainforests and lower montane scrub at 923-1,487 m.

Distribution: Central and South America, Thailand, South-eastern Queensland, and north-eastern New South Wales.

Specimens examined: Phu Luang Wildlife Sanctuary, Loei Province.

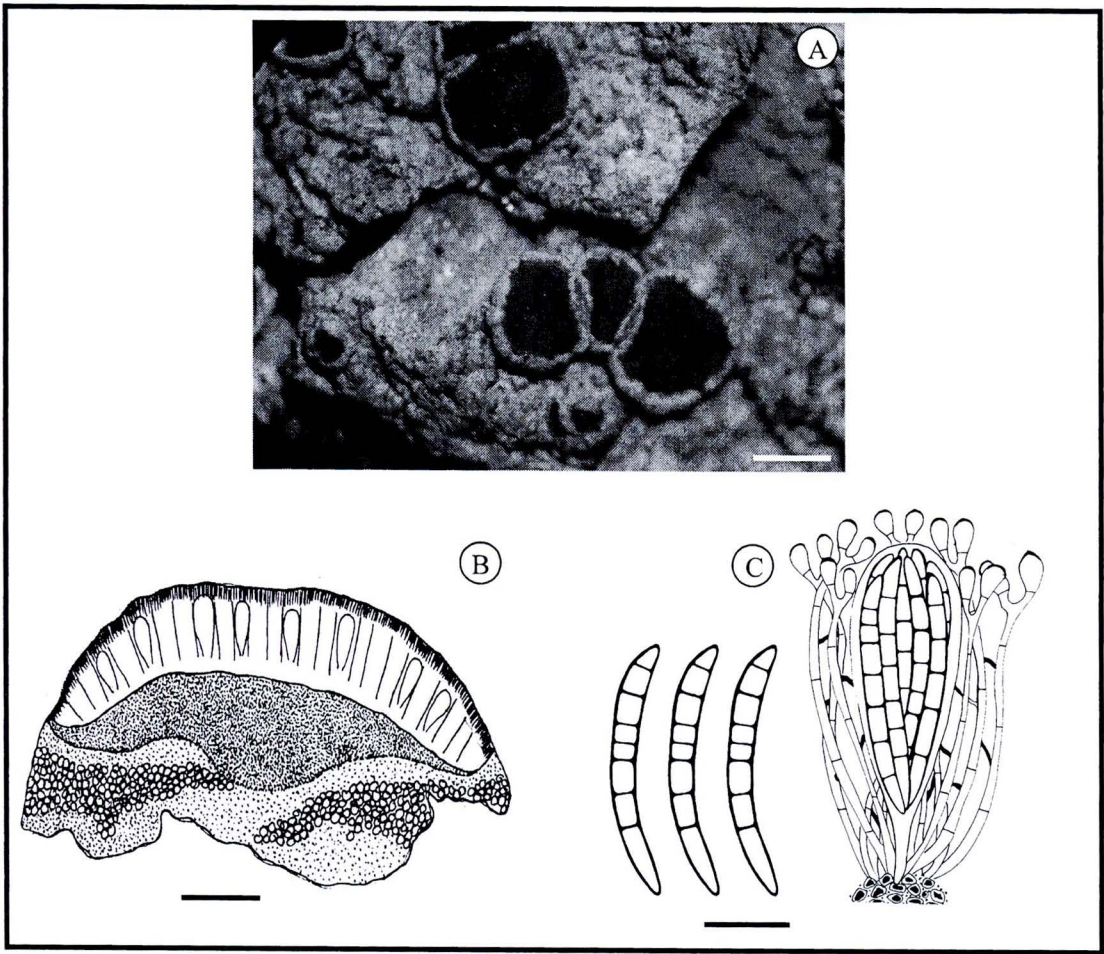


Figure 20 *Haematomma flexuosum* Hillm.

- Note. A = Apothecia lecanorine, sessile, red-brown [VC450(RAMK)]
 (scale = 1 mm)
- B = Illustration of vertical section of apothecia [VC450(RAMK)]
 (scale = 10.9 μm)
- C = Illustration of ascus with paraphyses and ascospores [VC450
 (RAMK)] (scale = 4.47 μm)

Phluang Wildlife Research Station, on trunk of an unidentified tree,
 12 November 2008, Varaporn Sriprang—VC639, VC640, VC652, VC653,
 VC654, VC656, VC658 & VC660(RAMK); *ibid.*, Khok Huai Toei, on trunk

of *Quercus lineata* Blume, 27 June 2008, Varaporn Sriprang—VC510, VC512, VC518, VC519, VC557, VC568 & VC599(RAMK); *ibid.*, around the Khok Nok Grabra Forest Protection Unit, 24 June 2008, Varaporn Sriprang—VC514(RAMK); *ibid.*, from Pha Chang Pan to Pha Somdet, on trunk of an unidentified tree, 24 June 2008, Varaporn Sriprang—VC515(RAMK); *ibid.*, the sideway to Lan Suriyan, on trunk of an unidentified tree, 25 June 2008, Varaporn Sriprang—VC450, VC926 & VC927(RAMK).

Observation: *Haematomma flexuosum* is characterized by the smooth to slightly rugulose, cream-colored to pale grey thallus, sessile apothecia with scarlet-red discs, 5-7-septate ascospores, medullary placodiolic acid and epithelial russulone.

4. *Haematomma wattii* (Stirton) Zahlbr., *Cat. Lich. univ.* 5: 776 (1928) (Staiger & Kalb, 1995, pp. 178-179).

Lecanora wattii Stirton, *Transact. Proc. New Zealand Inst.* 30: 383 (1898).

(see Figure 21)

Thallus: corticolous, whitish to pale grey, smooth, rimose, 150.8-277.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, cinnabar-red and concolorous at margin; epruina, 0.5-2.0 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 μ m thick; Hymenium: hyaline,

60.0-110.0 μm high; Subhymenium: indistinct; Hypothecium hyaline, 77.9-155.8 μm high; Paraphyses: strongly branched and reticulate, apical not conspicuously swollen, 31.5-38.9 μm high; Asci: clavate, *Lecanora*-type, 4.0-6.5 μm high; **Ascospores**: 4 per ascus, hyaline, fusiform, submuriform, (51.4)51.6-69.6-87.8(94.6) \times (6.0)6.45-7.8-9.1(9.4) μm ; **Pycnidia** and **Conidia** not observed.

Chemistry: thallus P+ yellow, K+ yellow, C-, KC-; disc K+ violet; containing atranorin, placodiolic acid and haematommone.

Habitats: occurring on barks in lower montane scrub and lower montane rainforests at 923-1,240 m.

Distribution: Central and South America, Africa, India, Thailand, Malaysia, Philippines, Papua New Guinea, Japan, New Caledonia, and Eastern Australia.

Specimens examined: Phu Luang Wildlife Sanctuary, Loei Province. Seven Chanal Station, on trunk of an unidentified tree, 13 November 2008, Varaporn Sriprang—VC507, VC625, VC627, VC628, VC629, VC669 & VC767(RAMK); *ibid.*, Khok Huai Toei, on trunk of *Quercus lineata* Blume, 27 June 2008, Varaporn Sriprang—VC527(RAMK); *ibid.*, Khok Phrommachan, on trunk of an unidentified tree, 26 June 2008, Varaporn Sriprang—VC501(RAMK); *ibid.*, Phuluang Wildlife Research Station, on trunk of an unidentified tree, 12 November 2008, Varaporn Sriprang—VC626, VC659, VC662, VC663, VC664, VC876, VC888 & VC889 (RAMK); *ibid.*, from Lan Suriyan to Khok Paek Dam, on trunk of *Lithocarpus truncatus* (King) Rehder & Wilson, 25 June 2008, Varaporn

Sriprang—VC509, VC511 & VC516(RAMK); *ibid.*, from Pha Chang Pan to Pha Somdet, on trunk of an unidentified tree, 24 June 2008, Varaporn
 Sriprang—VC508 & VC520(RAMK); *ibid.*, around the Khok Nok Grabra Forest Protection Unit, on trunk of an unidentified tree, 24 June 2008, Varaporn
 Sriprang—VC513(RAMK); *ibid.*, around the helicopter landing spot, on trunk of *Rhododendron lyi* H. Lév., 27 June 2008, Varaporn
 Sriprang—VC517, VC845, VC846, VC850, VC854, VC855, VC856, VC870, VC834, VC835, VC836, VC837, VC838, VC125, VC126 & VC127(RAMK).

Observation: *Haematomma wattii* is characterized by the whitish to pale grey thallus, sessile apothecia with cinnabar-red discs and submuriform ascospores.

5. *Haematomma* PL.1

(see Figure 22)

Thallus: corticolous, rarely saxicolous, white to grey, smooth, areolate, 150.8-258.5 mm thick; epruina; Soralia and Isidia absent; Prothallus not visible; Photobiont chlorococcoid; **Apothecia**: common, dispersed to crowded and entire, sessile; disc plane, cinnabar-red and concolorous at margin; epruina, 1.0-1.2 mm diam.; with lecanorine (thalline exciple); Parathecium: indistinct; Epihymenium: bright red, 10.0-15.0 μm thick; Hymenium: hyaline, 70.0-110.0 μm high; Subhymenium: indistinct; Hypothecium hyaline, 79.9-153.8 μm high; Paraphyses: strongly branched and reticulate, apical not

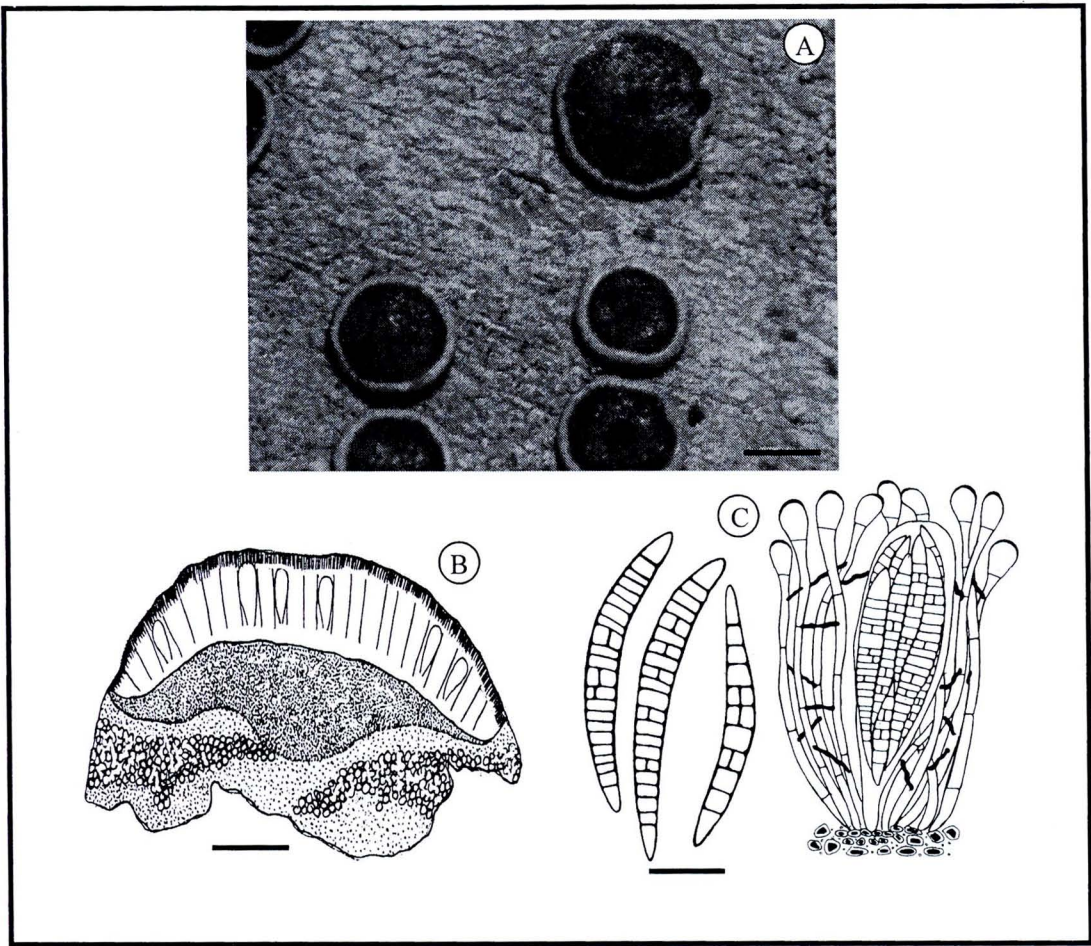


Figure 21 *Haematomma wattii* (Stirton) Zahlbr.

Note. A = Apothecia lecanorine, sessile, red [VC501(RAMK)]

(scale = 1.42 mm)

B = Illustration of vertical section of apothecia [VC501(RAMK)]

(scale = 10 μ m)

C = Illustration of ascus with paraphyses and ascospores [VC501

(RAMK)] (scale = 10.4 μ m)

conspicuously swollen, 32.5-40.9 μ m high; Asci: clavate, *Lecanora*-type, 4.0-6.5 μ m high; **Ascospores:** 8 per ascus, hyaline, helical, transeptate, 9-15-septated, (59.6)60.2-63.2-66.7(68.8) \times (3.4)3.6-4.3-5.1(5.3) μ m;

Pycnidia and **Conidia** not observed.

Chemistry: thallus P+ yellow, K+ yellow, C-, KC-; containing atranorin and isoplacodiolic acid.

Habitats: occurring on barks and rarely rocks in lower montane scrub and lower montane rainforests at 923-1,487 m.

Distribution: Thailand.

Specimens examined: Phu Luang Wildlife Sanctuary, Loei Province, around the Khok Nok Grabra Forest Protection Unit, on rocks, 20 May 2009, Chutamat Phraphuchamnong—CP502(RAMK); *ibid.*, around the helicopter landing spot, on trunk of an unidentified tree, 20 May 2009, Varaporn Sriprang—VC849, VC118, VC119 & VC120(RAMK); *ibid.*, Phuluang Wildlife Research, on trunk of an unidentified tree, 12 November 2008, Varaporn Sriprang—VC666, VC121, VC122, VC123 & VC124(RAMK).

Observation: *Haematomma* PL.1 is characterized by the areolate, white to grey, sessile apothecia with orange-red to red discs and ascospores transversely, helical 9-15-septate.

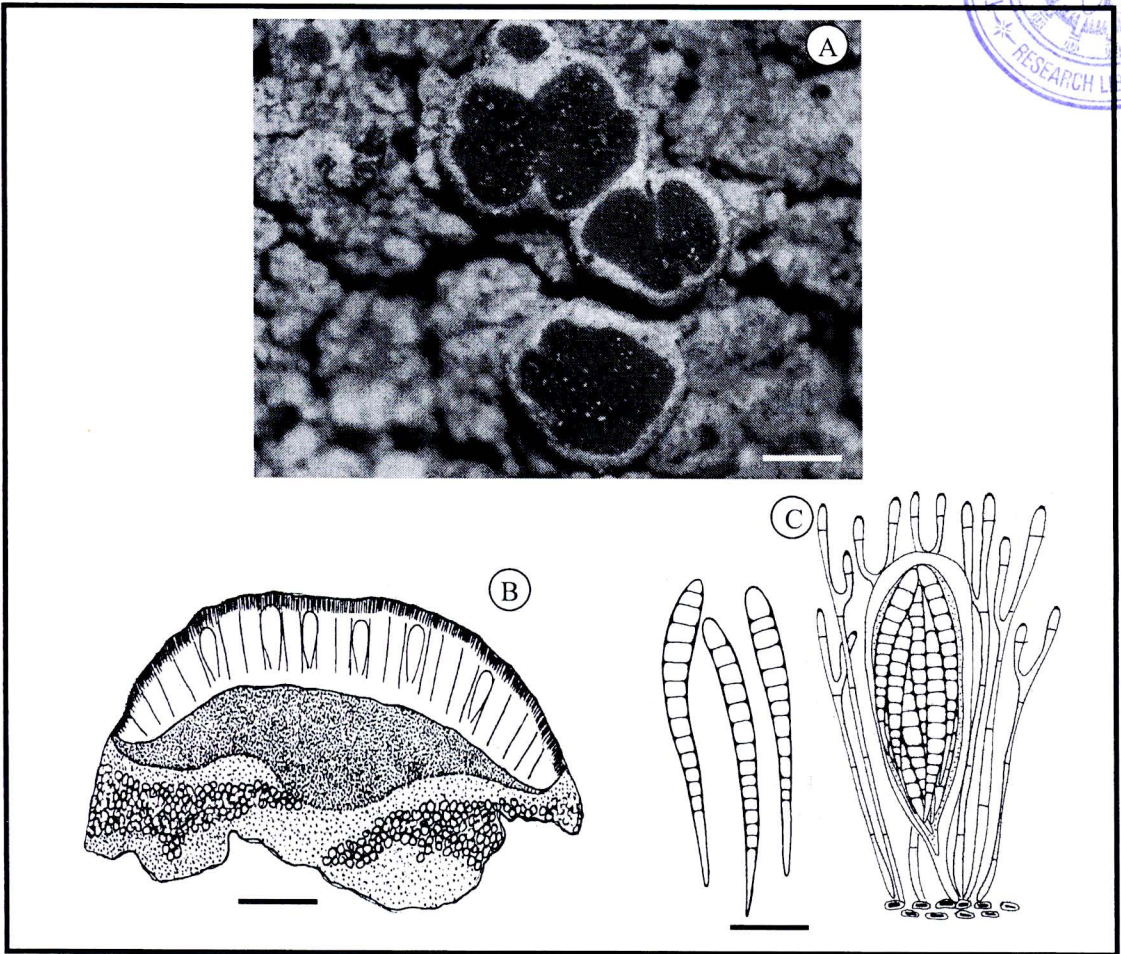


Figure 22 *Haematomma* PL.1

Note. A = Apothecia lecanorine, sessile, red-brown [CP502(RAMK)]

(scale = 1 mm)

B = Illustration of vertical section of apothecia [CP502(RAMK)]

(scale = 11.7 μ m)

C = Illustration of ascus with paraphyses and ascospores [CP502

(RAMK)] (scale = 6.36 μ m)