

**Ramaria fennica** (Karst.) Ricken. 1920. Vademecum. 264.

Basionym: Clavaria fennica Karst. 1868. Nat. Sallsk. Faun. et Flor.  
Fenn. 9: 372.

**var. violaceibrunnea var. nov.**

(Pl. IV Fig. 21, 22, Pl. XX Fig. 80)

A varietate fennica differt ramis maturis colorem griseibrunneum praebentibus.

Holotypus M-512 ad lacum Mason prope Shelton in comitato Mason pagi washingtoniaci 11/1/66 lectus, in herbario SUCO conservatus.

**Basidiocarp:** Habitat--terrestrial, growing in coniferous woods, under Western Yew, Amabilis Fir, Douglas Fir or Western Hemlock. Color--base of the fruiting body white, primordial branches "pale to dull violet" (17A-D3), during maturation color of branches changing to "reddish gray" (8B2), "brownish gray" (10C2) and finally "light to dark brown" (5C-E3-6), usually a thin, undulated band of "pale violet" remaining on the upper base and dull violet heavily tinting the brownish lower branches, context white to "pale yellow" (4A3). Base of dried basidiocarps a shade grayer than "yellowish white" (4A2), frequently with a grayish violet color still evident on the upper base, primordial branches "grayish violet" (17B-C3) and mature branches "yellowish brown" (5D-E5), context white to "light yellow" (4A4). Taste--not distinctive. Odor--not distinctive or faintly sweet. Form--fruiting bodies arising from conspicuous, white mycelial strands, small to medium size, 5-13 x 1.5-8 cm, sometimes two fruiting bodies arising in close proximity and fusing during development. Stipe fasciculate or single, slender to stout, 2.5-5 x 0.6-5.5 cm, often with small basal primordial branch systems; branching up to 6 times from the stipe, nodes polychotomous or dichotomous, axils mostly u-shaped and branches moderately divergent, lower internodes elongating up to 3 cm, up to 1.5 cm diam, upper branches generally less than 2 cm long and 0.5 cm diam, sometimes flattened below the axils, bifid to antlered near the apices; apices subacute to rounded. Consistency--fleshy-fibrous when fresh, when properly dried brittle and somewhat chalky-friable.

**Macrochemical Reactions:** Context of stipe non-amyloid; branch sections reacting positively with guaiac, positive reactions with  $\alpha$ -naphthol and guaiacol may occur within 30 min of application, no color changes noted for pyrogallol, phenol, and aniline; violet pigmented surface areas of either fresh or dried specimens quickly turning "Venetian red" (8D8) on direct application of 20% KOH or "maize yellow" (4A6) with 10% H<sub>2</sub>SO<sub>4</sub>.

**Microscopic Structures:** Spores--average 10.7 x 4.7 $\mu$ , range 9-13(15) x

3.5-5.5 $\mu$ , ellipsoidal, ornamented with distinct, cyanophilous warts of small to medium size, apiculus prominent, 0.5-1.5 x 1-1.5 $\mu$ , spores in deposit "light yellow" (4A6). Hymenium--basidia clavate, 52-75 x 8-12 $\mu$ , basally clamped, quickly collapsing after spore release, 1-4-sterigmate, mostly 4; sterigmata 4-9 $\mu$  long, nearly straight, slightly divergent; hymenium approx 60 $\mu$  thick and the subhymenium 30-50 $\mu$  thick. Subhymenial hyphae--interwoven and compact, 2-4 $\mu$  diam, clamped, thin-walled. Contextual hyphae--interwoven in the stipe, cells non-inflated, 2.5 $\mu$  diam near the stipe surface and up to 7 $\mu$  diam elsewhere, hyphae parallel in the branches, mostly non-inflated 3-10 $\mu$  diam, walls mostly thin, 0.25-0.5(1) $\mu$ , or slightly thickened in the stipe up to 1.5 $\mu$ ; smooth or distinctly fluted, ampulliform hyphal inflations 10-15 $\mu$  diam, walls smooth or nearly so; clamps abundant, the clamp cell sometimes inflating up to 6 $\mu$  diam; gleoplerous hyphae rare or absent.

**Collections Examined:**

<u>Number</u>	<u>Location</u>	<u>Date</u>
*M-512, Holotype	Mason Lk, near Shelton, Wash., Mason Co	11/1/66
M-8	Near Lk Kachess, Kittitas Co	10/4/64
M-66	Silver Springs, 30 mi SE of Enumclaw, Wash., Pierce Co	10/11/64
M-323	"	10/24/65
M-354	"	9/21/66
M-477	"	10/16/66
M-526	Mason Lk, near Shelton, Wash., Mason Co	11/7/66
M-843	"	11/1/67

**Discussion:** Ramaria fennica appears to be the nomenclatural reference point of an alliance of closely related taxa. The alliance is coherent and easily recognized by the violaceous juvenile branches which generally change color during maturation, and a distinctive spore morphology (Perreau-Bertrand, 1967). Two additional unifying characteristics of this alliance may be the positive color reactions on application of either an acid or base, and of guaiac. In 1913 and 1914 Maire reported that R. bataillei (Maire) Corner and R. versatilis Quélet give a positive reaction with tincture of guaiac, and a similar reaction occurs in R. fennica and its varieties. Secondly, the violet pigment, characteristic of the fennica complex, appears to be a natural indicator, changing color in response to pH changes (Marr, 1968; Petersen, 1971b). On direct application of 20% KOH the violet color changes to "venetian red" (8D8), and on application of 10% H<sub>2</sub>SO<sub>4</sub> it turns to "maize yellow." This reaction occurs even in dried specimens, and it has proven diagnostic for R. fumigata (Peck) Corner (NYS, Type), R. fennica (NCU, C-486; CUP-A, 5369) and R. bataillei (CUP-A, 24856). This macrochemical reaction is of particular interest in

that it may reveal the physiological basis for the yellowish color component typical of var. fennica, and the flame-red base of R. wettsteinii (Singer) Parmasto. Whether or not environmental factors can influence the pH level in fruiting bodies and consequently the expression of fruiting body color needs to be investigated.

Despite the easy recognition of species belonging to the fennica complex, the differences occurring within the alliance are subtle and difficult to assess in the absence of a thorough analysis of all related species. This point is particularly emphasized by Malençon (1957) in his analysis of R. versatilis, R. cedretorum var. eucedretorum Werner, and R. fumigata (sensu Pilát).

Variety violaceibrunea is principally distinguished from var. fennica by color of the fruiting body. Other differences may be a generally more slender habit and more finely ornamented spores. Corner (1970) describes the branches of R. fennica as, "olive to fuliginous yellow with bright yellow tips," and Peck (1879) gives the color of R. fumigata branches as "smoky-ochraceous." Mature branches of our specimens vary from light to dark brown with a distinctive pale to grayish violet color on the upper base and lower branches. Malençon (1957) and Corner emphasize that R. fumigata, unlike R. fennica, is a species of frondose woods. Some authors (Coker, 1923; Petersen, 1967b) regard R. fumigata synonymous with R. fennica, a point which needs further study and clarification.

This new variety exhibits wide latitude with respect to spore dimensions and coarseness of ornamentation. Some of our specimens (e.g. M-323) have spore dimensions identical to R. fennica sensu Coker and Bresadola (NCU, C-486; CUP-A, 5369). Other specimens of ours (e.g. M-512) have spore dimensions identical to R. fumigata (NYS, Type). The spore ornamentation of the western Washington material is consistently finer than that of the eastern U. S. counterpart. The range of characteristics encountered in our collections does not warrant separating the extremes into varieties.

Table III. Spore Data For Ramaria fennica

Collection	Spore Average	E Value**
M-526	11.1 x 4.5 $\mu$	2.47
M-323	11.4 x 4.7	2.43
<u>C. fennica</u> (NCU, C-486)	11.4 x 4.7	2.43
M-8	11.0 x 4.6	2.39
M-477	10.6 x 4.6	2.30
<u>C. fennica</u> (CUP-A, 5369)	10.8 x 4.7	2.30
M-354	10.7 x 4.8	2.23
M-66	10.4 x 4.7	2.21

Table III (continued)

Collection	Spore Average	E Value**
M-843	9.9 x 4.5 $\mu$	2.20
*M-512	10.4 x 4.8	2.17
<u>C. fumigata</u> (NYS, Type)	9.5 x 4.4	2.16
<u>C. fumigata</u> (M-1679, Oneonta, N. Y.)	9.9 x 4.8	2.06
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Average (Named Coll. Excluded):	10.7 x 4.7 $\mu$	2.28
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Range of Averages:	9.9-11.4 x 4.5-4.8 $\mu$	2.16-2.47
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**E = average spore length/average spore width		
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PLATE IV

Species of Subgenus Laeticolora

Camera Lucida Drawings of Spores, Standard Line = 10 $\mu$

Figure		Collection
19.	<u>R. cystidiophora</u> var. <u>fabiolens</u>	M-339 (Type)
20.	<u>R. cystidiophora</u> var. <u>maculans</u>	M-521 (Type)
21.	<u>R. fennica</u> var. <u>violaceibrunnea</u>	M-512 (Type)
22.	<u>R. fennica</u> var. <u>violaceibrunnea</u>	M-323
23.	<u>R. flavigelatinosa</u> var. <u>flavigelatinosa</u>	M-246 (Type)
24.	<u>R. flavigelatinosa</u> var. <u>carnisalmonea</u>	M-723 (Type)

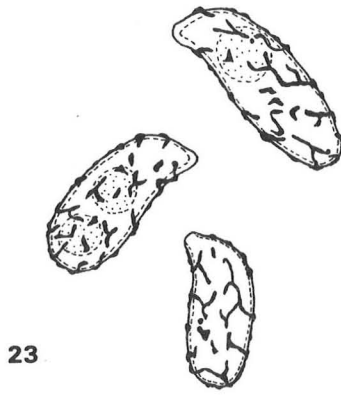
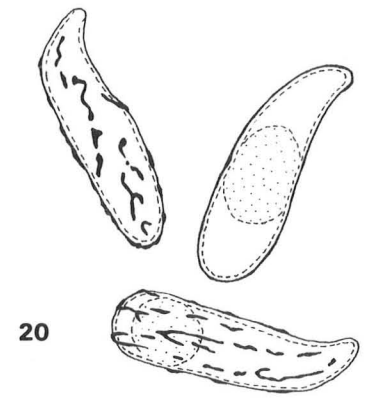


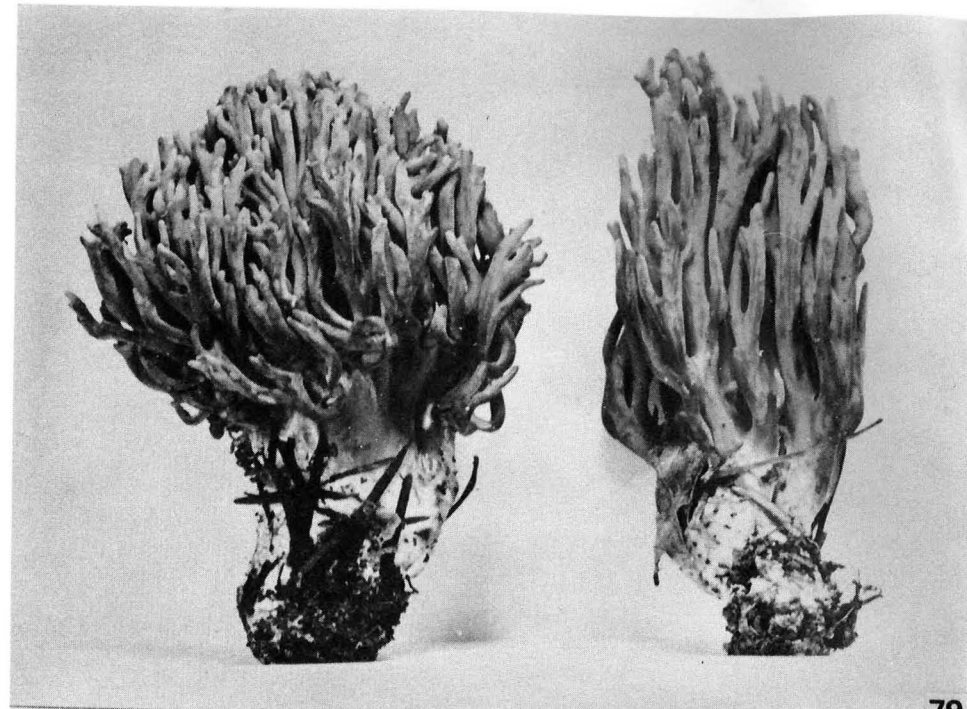
PLATE XX

Species of Subgenus Laeticolora

Figure Collection

79. R. testaceoflava var. brunnea

Fruiting bodies 5-13 cm tall x 1.5-7.5 cm broad M-63



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80. R. fennica var. violaceibrunnea

Fruiting bodies 5-13 cm tall x 1.5-8 cm broad M-354



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