

Shun-ichi UDAGAWA* & Kouhei FURUYA** : **The genus**
Leuconeurospora

宇田川俊一*・古谷航平** : *Leuconeurospora* 属について

(Plate II)

A monotypic, cleistoascmycete genus *Leuconeurospora* Malloch et Cain (1970)^{*)} was recently created for an accommodation of *Eurotium pulcherrimum* Winter. The genus is characterized by dark reddish brown, cephalothecoid ascocarps, irregularly disposed, globose asci, and hyaline, longitudinally ridged ascospores without germinal pores. Malloch and Cain (1970)^{*)} placed *Leuconeurospora* under the new family Pseudeurotiaceae of cleistothelial Ascomycetes with the other nine genera. In spite of their efforts, the accurate placement of the fungus remains in doubt. Quoting Malloch and Cain, "...Because it has never been studied in culture its inclusion in the Pseudeurotiaceae can only be tentative."

In recent years we have made numerous collections of coprophilous Pyrenomycetes, found on the various kinds of animal dungs in Japan (Furuya and Udagawa)¹⁾. During this survey, an unusual species of the cleistothelial Ascomycete was encountered on squirrel dung in the Hidaka Mountains, Hokkaido, of northern Japan. Immediately the fungus has been identified as *L. pulcherrima*. This is the first record from Japan.

While in the summer of 1971, an interesting but unknown collection of coprophilous Ascomycete was developed in a laboratory moist chamber, in which a small amount of goat dung from the Iso Park, Kagoshima-shi, of southern Japan, was placed. Attempts to identify this material led to a critical study of the known species in relation to features observed on the undescribed species. By coincidence, there is a considerable similarity in ascospore morphology between the second undescribed species and the first

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collection *L. pulcherrima*. The new fungus differs from *L. pulcherrima* principally in the character of its elongate cleistothecia and the rich reddish brown color of its massed ascospores. Its rather incomplete, cephalothecoid character in the cleistothecial peridium is also different from that of *L. pulcherrima*. It is of special interest in being the new member of *Leuconeurospora* and in showing that production of reddish brown ascospores, from which it has been suggested the more possible relationship within the cleistothecial Ascomycetes.

This paper describes these two collections.

Leuconeurospora pulcherrima (Winter) Malloch et Cain, in Can. J. Bot., 48: 1820 (1970). (Fig. 1, Pl. II, 3, 4)

Eurotium pulcherrimum Winter, in Vidensk. Meddel. Naturh. Foren. Kjøbenhavn, 1876: 311 (1877) and in Rabenhorst's Krypt.-Fl. Deutschl. Oesterr. Schweiz, ed. 2, 1(1): 60 (1887).

Cephalotheca pulcherrima (Winter) Hoehnel, in Ann. Mycol., 15: 360 (1917).

Cleistothecia scattered, superficial, dark brown to nearly black, opaque, spherical, 220–300 μ in diam., bare. Peridium of the cleistothecium yellowish brown to dark brown, cephalothecoid, consisting of several, polygonal plates of cells which split at maturity along well-defined suture lines; cells of outer layer thick-walled, angular and 4–12 μ in diam. at the center of the plates, elongate and 6–16 \times 4–10 μ toward the margins, cells of inner layer hyaline. Asci irregularly arranged, 8-spored, globose to subglobose, 8–11 μ in diam., thin-walled, evanescent. Ascospores hyaline, ellipsoid to somewhat fusiform, 4.5–7 \times 3–4 μ , ornamented with a few, somewhat anastomosing, fine, mostly longitudinal or oblique lines which sometimes form a reticulum, without germinal pores. Conidial state not observed.

Habitat: on squirrel dung, Hidaka-machi, Saru-gun, Hokkaido, July 26, 1971, NHL 22692.

This is in good agreement with the most complete description of *L. pulcherrima* given by Malloch and Cain.³⁾ The species has been reported previously only from Denmark, Germany and Canada.

Leuconeurospora elongata Udagawa et Furuya sp. nov. (Fig. 2, Pl. II, 5~8)

Cleistotheciis sparsis, superficialibus vel semi-immersis, oblongis, 300–

360×200–220 μ , paene nigris, glabris. Peridio cleistothecii saturate rubido-brunneo, opaco, coriaceo, aliquantum cephalothecoidio, in scutulis radiatis; cellulis exterioribus crassis, rubido-brunneis, prolatis, 6–18×5–8 μ . Ascis numerosis, irregulariter dispositis, octosporis, globosis vel subglobosis, 10–12×8–10 μ , tenuibus, nonstipitatis. Ascosporis dilute flavo-brunneis, in massa rubido-brunneis, ellipsoideis vel rhombiformibus, 5–7×3.5–4.5 μ , cum aliquot, longitudinalibus, interdum anastomosantibus costis, sine foraminibus germinalibus. Conidiis absentibus.

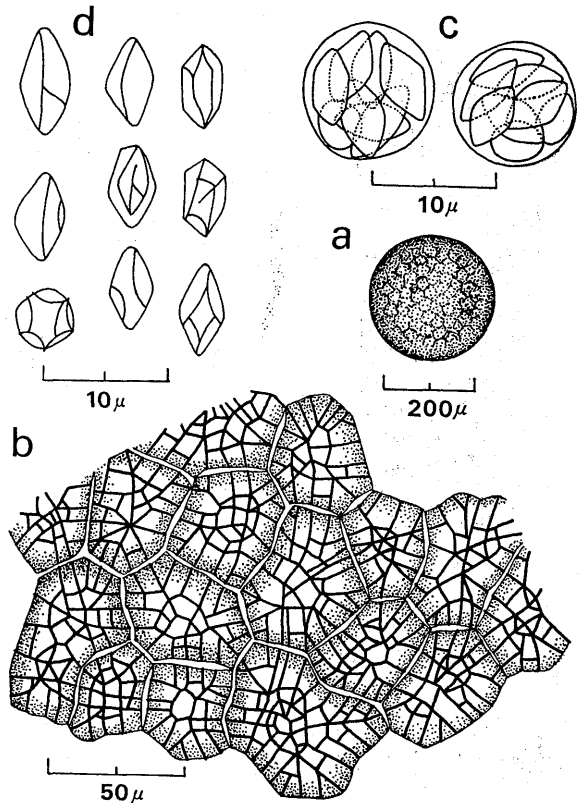


Fig. 1. *Leuconeurospora pulcherrima*. a. Cleistothecium. b. Cephalothecoid plates of peridium. c. Ascus. d. Ascospores.

Holotypus: In fimo capri, Japan, Kagoshima-ken, Kagoshima-shi, April 15, 1971, NHL 22691.

Cleistothecia scattered on the surface of substrate, with the lower part more or less semi-immersed, oblong, 300–360×200–220 μ , nearly black, glabrous. Cleistothecial peridium dark reddish brown, opaque, coriaceous, likely cephalothecoid, consisting of several plates of linear cells which separate easily along the furrows at maturity; cells of the outer layer dark reddish brown, elongate in surface view, rounded in cross section, 6–18×5–8 μ , thick-walled; the inner cells hyaline, evanescent. Ascus numerous,

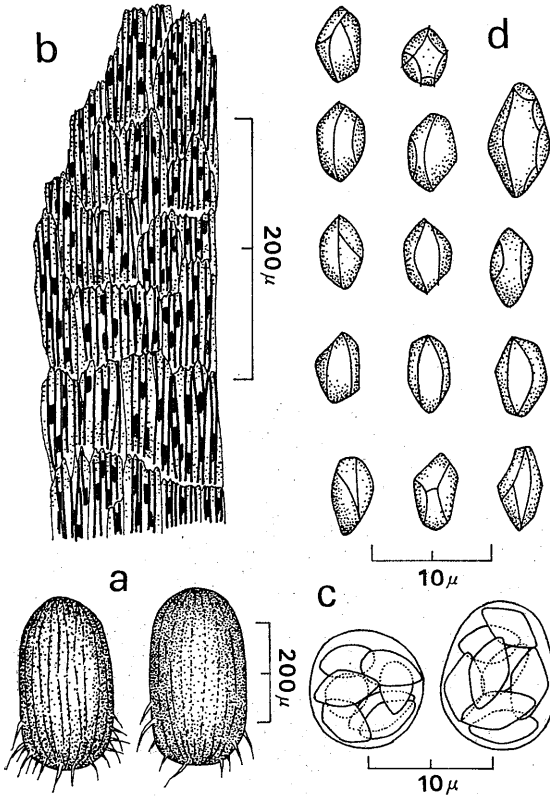


Fig. 2. *Leuconeurospora elongata*. a. Cleistothecia. b. A portion of cephalothecoid-like peridium. c. Asci. d. Ascospores.

gienic Sciences, Tokyo.

It would appear that ascospore color is the most dependable criterion on which to separate the species although the other criteria such as shape and exterior condition of cleistothecium may be also helpful as secondary characteristics.

An account of the new characters is given in *L. elongata* may be presented in the another interest of the paper. The irregularly disposed, globose asci and one-celled, reddish brown ascospores suggest a possible relationship of the genus with *Microascus* and the other members of Microascaceae. Recently, Malloch (1970)²⁾ revised the concepts of the Microascaceae,

irregularly arranged, 8-spored, globose to subglobose, $10-12 \times 8-10 \mu$, thin-walled, non-stipitate. Ascospores pale yellowish brown, reddish brown in mass, ellipsoid to rhomboid, $5-7 \times 3.5-4.5 \mu$, with surface marked by a few, longitudinal ridges which are sometimes anastomotic to form a reticulum, without germinal pores. Conidial state unknown.

Habitat: On goat dung, Kagoshima-shi, Kagoshima-ken, April 15, 1971, NHL 22691. Type specimen deposited in the Mycological Collection, National Institute of Hy-

with a surprising expansion inclusive of two nonostiolate genera *Kernia* and *Petriellidium*. The ascospores in *L. elongata* are very characteristic as outlined in the above description, while *L. pulcherrima*, in having hyaline ascospores, probably appears to occupy a position somewhat transitional towards the Pseudeurotiaceae. They differ from the more typical members of this family, however, in producing cephalothecoid (areolate) ascocarps which have been considered as a different type of modification in dispersal mechanism of the Ascomycetes. Following the opinion by Malloch and Cain,³⁾ this modification of ascocarp wall is of no significance at the family or even genus level.

According to Malloch,²⁾ a dextrinoid character of ascospores is especially noteworthy and universal throughout the Microascaceae. He also said that only the young ascospores exhibit this property and the germinal pores of ascospores are especially easy to observe in Melzer's solution when this reaction occurs. Our efforts to culture both species were not successful. Thus, it is uncertain whether the dextrinoid reaction of young ascospores occurs in them, as well as the presence of germinal pores. To draw more firm conclusion, attempts to culture these species will be in a future solution.

We are indebted to Dr. Y. Doi and Mr. H. Hagiwara, National Science Museum, Tokyo, for supplying dung sample.

Summary

A new species of *Leuconeurospora* (cleistothecial Ascomycete), *L. elongata*, is described on the basis of collection from goat dung in Japan. Distinguishing characters are the elongate cleistothecia and the rich reddish brown color of massed ascospores. The type species, *L. pulcherrima* (Winter) Malloch et Cain has been also collected on squirrel dung. These appear to be the first report of *Leuconeurospora* from Japan. The possible relationship of the genus to the Microascaceae is discussed.

References

- 1) Furuya, K. & S. Udagawa. 1972. J. Gen. Appl. Microbiol. (Tokyo), 18: 433-454, 455-467. — & —, 1973. Trans. Mycol. Soc. Japan, 14: 7-30.
- 2) Malloch, D. 1970. Mycologia, 62: 727-740.
- 3) Malloch, D. & R. F. Cain.

1970. Can. J. Bot., 48: 1815-1825.

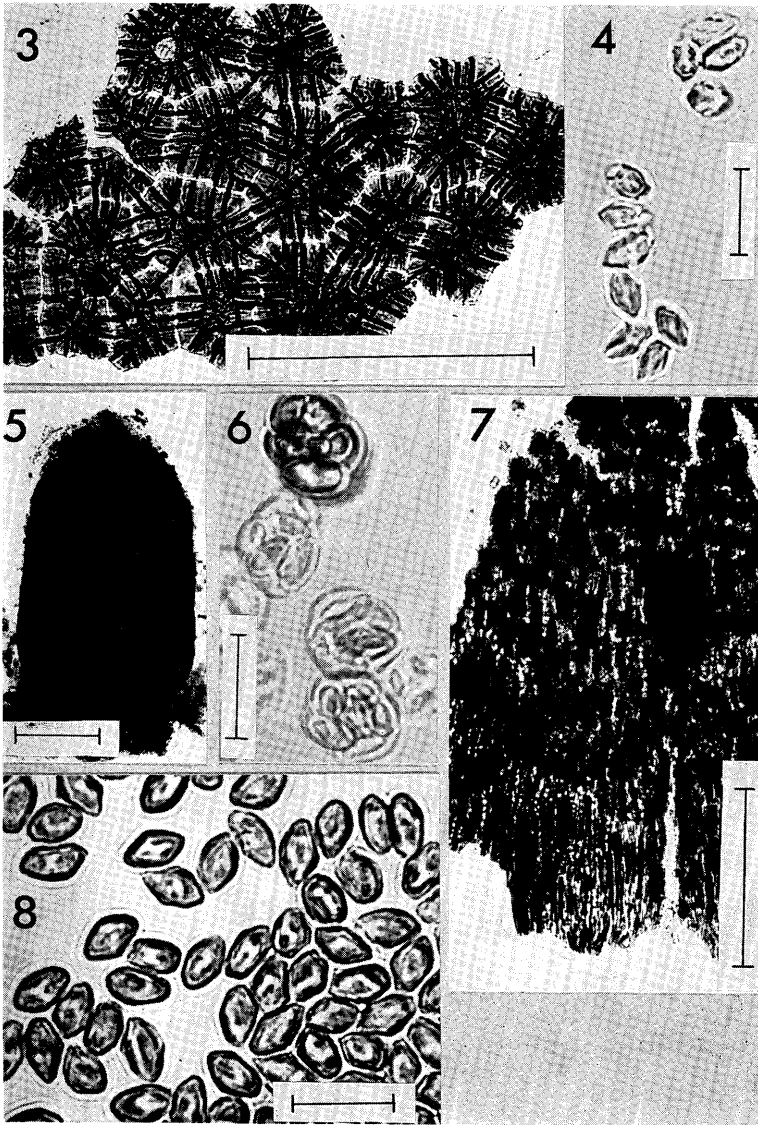
Explanation of Plate II

Figs. 3, 4. *Leuconeurospora pulcherrima* 3. Peridial plates. 4. Ascospores.
Figs. 5-8. *L. elongata* 5. Elongate cleistothecium. 6. Globose asci.
7. A portion of cleistothecial peridium, showing cephalothecoid-like
arrangement. 8. Ascospores. (scales: 3, 5, 7=100 μ ; 4, 6, 8=10 μ)

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Leuconeurospora 属は 1 属 1 種, *L. pulcherrima* をタイプ種として 1970 年創設された。Malloch, Cain はこれを新しく提案した *Pseudeurotiaceae* 科に含めている。*L. pulcherrima* は盾板状に裂ける子のう果中に球形の子のうを散在形成し、成熟と共に白色菱形状の子のう胞子を分散する。胞子表面には数本の脈状隆起がみられる。本種は今までドイツ、デンマーク、カナダから知られていたが、著者らは日高山脈で採集されたリスの糞から発見した。次いで、*L. pulcherrima* の子のう胞子に極めて類似する未記載の *Leuconeurospora* 1 種を鹿児島市内磯公園で採集したトカラ山羊の糞から見つけた。これを *L. elongata* として記載した。この新種は楕円状に伸びた子のう果、赤褐色の子のう胞子を形成する特徴がある。子のう果壁の状態も *L. pulcherrima* ほど割れ目が明瞭でない。*L. elongata* の子のう胞子塊が赤褐色を呈し、子のうが子のう果中に不規則に散在する性質からみて *Leuconeurospora* の分類学的位置は *Microascaceae* 科に関係あるものと推察される。両種とも培養不成功のため正確な結論は将来の問題として残されよう。

□結城嘉美：山形県の植物誌 A5 版, 14 種を含むカラーの絵 2, 白黒写真 72, 大判地図 1, 本文索引共 462 頁, その内植物目録 262 頁。山形県立博物館発行, 1972 年 3 月 21 日。会員のみで頒布する改定版。結城氏の多年にわたる成果であって、総説として県の地形, 気候, 区系, 植生, 高山の分布, 天然記念物, 方言などに区分され, 附録として大形地形図がつけてある。従来断片的に知られていた同地方の植物分布が明らかになり, ことに秘境視されていた高山地帯のものが明瞭になり極めて有益である。なお同地と本書に関係のある佐藤正己博士の「発刊を祝して」なる一文から, 本書の出来るまでの様子がうかがわれる。ついでながら, この種の刊行物は多くの人が参考にするものであるから, 一定の実費で広く行きわたるようになされたい。(久内清孝)



S. UDAGAWA & K. FURUYA: The genus *Leuconeurospora*