

ESCULENT BASIDIOMYCETES GROWING ON COLLINE ZONE IN JAPAN

Esculent Basidiomycetes Growing in *Castanopsis cuspidata*
forest in Tokai District

by

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Introduction

Japan extends from the high latitudes to the low latitudes. Therefore, various vegetation zones, namely subtropical zone, warm temperate zone, temperate zone and subarctic zone, are recognized in this country. Since it is much rainfall from spring to autumn and humid in all seasons, the sylvan fungi grow remarkably throughout the year.

Recently the fungus has been regarded to be important as aromatic savory foodstuff and as sightseeing resources.

Most of the esculent basidiomycetes grow on colline zone. This zone occupies the lowest part of the vertical distribution of plant. In this district, colline zone is located up to about 800 meters above sea level. Climatic climax is the evergreen forest consisting of *Castanopsis cuspidata*, *Cyclobalanopsis* sp., *Machilus thunbergii* and *Camellia japonica*. Since cities and villages are developing on this zone, most of the present forests are secondary succession such as *Pinus Thunbergii* forest, *P. densiflora* forest, *Quercus serrata* forest, mixed forest of evergreen and deciduous and abborestation. The sociological studies of esculent fungi in *Castanopsis cuspidata* forest, a type of climax forest of colline zone in Tokai district, were reported in this paper.

Methods

- 1) Community ecological and analytical survey was carried out in *Castanopsis cuspidata* forest as the most important environment of fungus. Then, the composition of fungus was arranged.
- 2) Sociological studies were based on the community ecological theory, and analytical investigation was carried out. Coverage,¹⁾ density,²⁾ frequency,³⁾ relative density²⁾ and sociability²⁾ were investigated by the quadrat method of 3 × 4 meters. These result were arranged for composition, and analyzed from fungus communitical point of view.
- 3) Composition of the forest in which fungi grow

The evergreen forests are distributed from seaside district of 38° N of

the southern part of northeastern districts to Yakushima and Tanegashima islands in Japan. In the Tokai district, vertical distribution of evergreen forest is observed up to 800 meters above sea level. *C. cuspidata* forest is distributed up to 300 meters above the sea. Plant community was investigated particularly in *C. cuspidata* forest in which fungus grew.

The result indicates *C. cuspidata* forest in Tokai district belongs to *Sakakiето-Shiietum cuspidatae*. Namely, *Castanopsis cuspidata* is absolute dominant species, and *Cleyera japonica*, *Cyclobalanopsis glauca* and *C. saricina* var. *stenophylla* are secondly dominant species. The climax community in this forest is *Sakakiето-Shiietum cuspidatae* whose characteristic species are *Cleyera japonica* and *Castanopsis cuspidata*. Further analytical research indicates the growth of *C. glauca* in high frequency, and the development of Subass. *Cyclobalanopsidetosum* whose characteristic species is *C. glauca*, *Castanopsis cuspidata* community and Subass. *dicaletosum* in which *Symplocos glauca* is dominant and diarakteristic species. It is observed to develop Subass. *Myrsinetosum* in which *Myrsine seguinii* and *Myrica rubra* are differential species and Subass. *Cyclobalanopsidetosum* in which *Cyclobalanopsis gilva* is differential species. In these forests, moss and lichen such as *Leucobryum bowringii*, *Hypnum plamaeforme*, *Isopterygium textorii*, *Dicranum japonicum* and *Bazzania pompeana* grow vigorously.

4) Fungus in the *Castanopsis cuspidata* forest

a) Fungi develop through the year in *C. cuspidata* forest of Tokai district, but especially in summer. The period of late June and early August is the best time of the year for growth of fungus.

b) Results of investigation were arranged for Table 2. From a viewpoint of composition, fungus community was composed of dominant group, *Russula adusta*, *R. lepida* and *Leccinum scabrum*. This community may be named *Russula adusta-R. lepida* community.

c) *Castanopsis cuspidata*, *Cyclobalanopsis glauca*, *C. salicina* var. *stenophylla* and *C. gilva* were observed to bemycorrhiza tree offungus in *Castanopsis cuspidata* forest.

d) *Russula adusta*, *R. lepida*, *R. subnigricans*, *L. piperatus*, *L. violascens*, *Amanita vaginata* and *A. vaginata* var. *bulva* were recognized as fungus to form ectotrophic mycorrhiza.

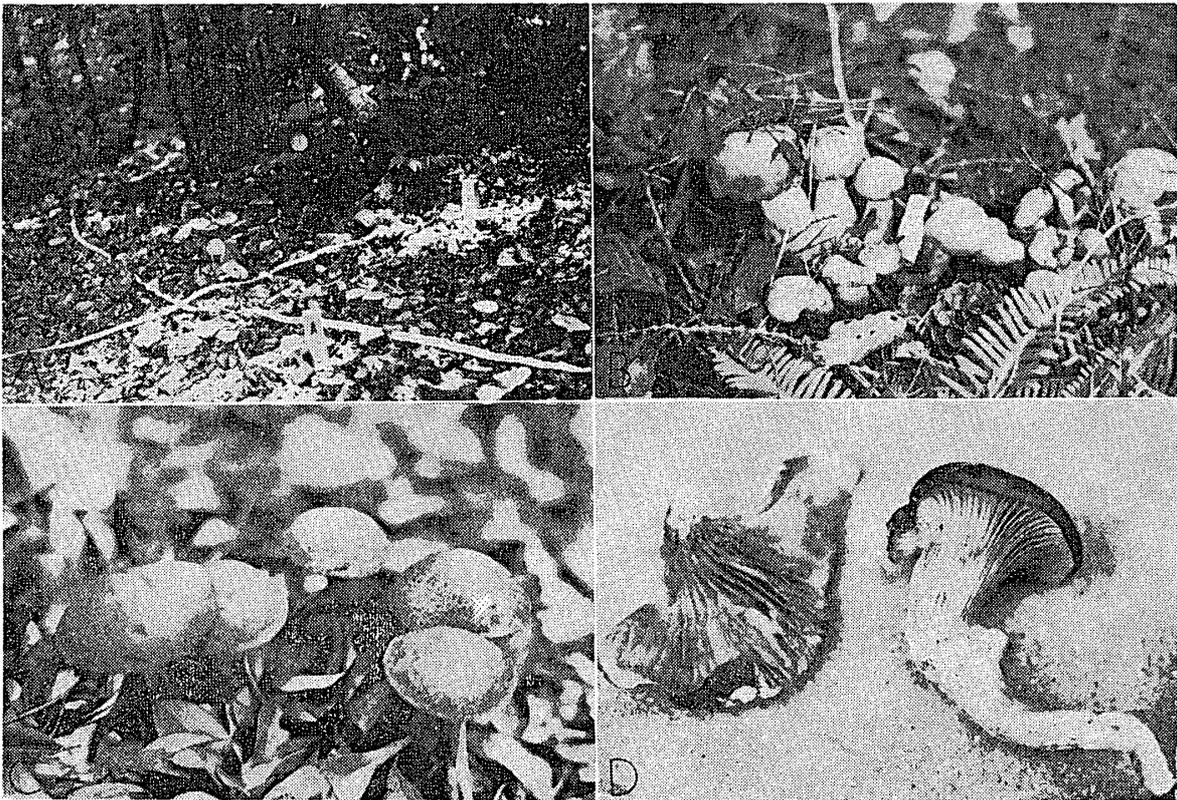
e) As for Some species of fungus, ectotrophic mycorrhiza were formed on the trees, not only one species but ligneous plants belonged to the same genus or the same family.

- 1) PENFOUND and HOWARD (1940).
- 2) BRAUN-BLANQUET (1928-1951).
- 3) RAUNKIAER (1909-1910).

Summary

In this paper, the investigations of fungus growing in *Castanopsis cuspidata* forest developing in Tokai district are reported.

- 1) From the viewpoint of phytosociology, *C. cuspidata* forest belongs to *Sakakieto-Shiietum cuspidatae*. These forests were classified into the faciations of Subass. *Cyclobalanopsidetosum*, *Castanopsis cuspidata* community, Subass. *dicaletosum*, Subass. *Myrsinetosum* and Subass. *Cyclobalanopsidetosum*.
- 2) *Russula adusta-R. lepida* community was formed in *Castanopsis cuspidata* forest.
- 3) Fungi forming the mycorrhiza such as *Russula*, *Leccinum*, *Lactarius* and *Amanita* were recognized.
- 4) Ligneous plants on which mycorrhiza were formed were recognized to be *Castanopsis* and *Cyclobalanopsis*.



- A. Ecology of *Russula lepida* existing in *Castanopsis cuspidata* forest of M. Kirara-dake.
- B. *Lyophyllum aggregatum*.
- C. *Leccinum scabrum*.
- D. *Phylloporus rhodoxanthus*

species	Sakakielo-Shiitlum <i>cuspidatae</i>	Sabass. <i>cyclobalanopsi-</i> <i>detosum</i>	Sabass. <i>dicalotosum</i>	Sabass. <i>Myrsinetosum</i>	Sabass. <i>cyclobalanopsi-</i> <i>detosum</i>
<i>Castanopsis cuspidata</i>	4 • 4	3 • 3	4 • 4	4 • 4	4 • 4
<i>Machilus Thunbergii</i>	1 • 1	4 • 4	4 • 4	5 • 5	3 • 3
<i>Cleyera japonica</i>	4 • 4	1 • 1	+	2 • 2	1 • 1
<i>Ilex integrata</i>	1 • 1	1 • 1	+	2 • 2	3 • 3
<i>Eurya japonica</i>	+	+	+	+	+
<i>Vaccinium bracteatum</i>	+	+	+	+	+
<i>Camellia japonica</i>	+	+	+	+	+
<i>Photinia glabra</i>	+	+	+	+	+
<i>Cyclobalanopsis glauca</i>	+	+	+	+	+
<i>C. salicina</i> var. <i>stenophylla</i>	+	2 • 2	+	+	+
<i>Neolitsea sericea</i>	+	+	+	+	+
<i>Illicium anisatum</i>	+	1 • 1	+	+	+
<i>Dicalix glaucus</i>	+	1 • 1	+	+	+
<i>Dendropanax tribidus</i>	+	+	+	+	+
<i>Ligustrum japonicum</i>	+	+	+	+	+
<i>Lyonia ovalifolia elliptica</i>	+	1 • 1	+	+	+
<i>Myrica rubra</i>	+	+	+	+	+
<i>Myrsine seguinii</i>	+	+	+	+	+
<i>Symplocos prunifolia</i>	+	+	+	+	+
<i>Daphniphyllum Tetjismanni</i>	+	+	+	+	+
<i>Meliosma myriantha</i>	+	+	+	+	+
<i>Cyclobalanopsis gilva</i>	+	+	+	+	+
<i>Quercus phyllitreaeoides</i>	+	+	+	+	+
<i>Carpinus japonica</i>	+	+	+	+	+
<i>Chamaecyparis obtusa</i>	+	+	+	+	+
<i>Cryptomeria japonica</i>	1 • 1	+	+	+	+
<i>Pinus densiflora</i>	+	+	+	+	+

Table. 1 Summarized association table of Sakakielo-Shiitlum *Cuspidatae*.

Species	Density	Frequency	Relative-density	Coverage	Sociability
<i>Russula lepida</i>	13.68	32.4	23.6	1	5
<i>R. adusta</i>	18.21	41.8	33.5	1	5
<i>R. subnigricans</i>	0.03	3.8	0.35	+	1
<i>Leccinum scabrum</i>	8.15	29.6	18.8	1	3
<i>Strobilomyces floccopus</i>	0.22	8.8	2.3	+	2
<i>Boletellus russellii</i>	0.08	2.4	0.8	+	1
<i>Lactarius volemus</i>	0.77	8.9	8.4	+	2
<i>L. piperatus</i>	0.08	4.8	0.4	+	2
<i>L. camphoratus</i>	0.05	2.3	0.8	+	1
<i>L. violascens</i>	0.13	6.5	1.4	+	3
<i>Phylloporus rhodoxanthus</i>	0.06	2.0	0.7	+	2
<i>Amanita vaginata</i>	0.85	11.1	8.8	+	2
<i>A. vaginata</i> ver. <i>fulva</i>	0.38	8.6	2.3	+	2
<i>A. echinocephala</i>	0.03	1.8	0.7	+	1
<i>Marasmius maximus</i>	0.87	3.2	9.4	+	2
<i>Tylopilus areolatus</i>	0.08	2.7	0.4	+	2
<i>T. virens</i>	0.03	1.6	0.6	+	1
<i>Rhodophyllus murrainii</i>	0.03	2.3	0.35	+	1
<i>Ramaria botrytis</i>	0.02	3.2	0.7	+	1
<i>Galerina clavata</i>	0.04	3.7	0.4	+	2
<i>Mycena roseocandida</i>	0.07	7.4	0.8	+	2
<i>Tricholoma album</i>	0.02	3.1	0.6	+	3
<i>T. fulvocastaneum</i>	0.03	2.0	0.5	+	1
<i>Lentinus edodes</i>	0.02	1.2	0.3	+	1
<i>Pulveroboletus auriflammeus</i>	0.02	1.1	0.2	+	1
<i>P. retipes</i>	0.02	1.0	0.1	+	1
<i>Cantharellus floccosus</i>	0.02	1.0	0.2	+	1

Table. 2 Summarized community table of *Russula adusta*-*R. lepida*.