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Basidiospore Development and Fine Structure of *Entoloma violaceobrunneum*

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황보라 외대버섯의 담자포자의 발생과 미세구조

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Abstract

Four sterigmata of papillaform *E. violaceobrunneum* are developed from crator-shaped basidium. The apex of sterigma is swollen to a small globeform. And then it is swollen to a clubform. The clubform is again swollen to a ellipticalform, and then more than six spots of spore surfaces are ramdomly depressed with hilum axes. When the depression of surface of a elliptical spore is over, the spore is a heterodiametrical spore of multi-angular.

KEYWORDS : basidiospore, *E. violaceobrunneum*, sterigma, hilum, heterodiametrical, multi-angular.

The fine structure and the basidial delopment of higher fungi has been studied by workers(Clemencon, 1969. Corner, 1948. Lerbs, 1971. Talbot, 1973. Thielkl, 1976). The developmental structure and mature basidiospore have been studied with electron microscope(Clemencon, 1970. Kühner, 1973. McLanghlin, 1973, 1977. Nakai, 1975. Nakai and Uhiyama, 1974, 1978. Pegler and Young, 1971. Perreau-Bertrand, 1967. Wells, 1965).

Spore development of the *Russula* have been studied in several other hymenomycetes taxa hypothesis, which attempt ot describe general aspects of the basidiospore structure and development in the genus *Russula*(Berge, 1979).

These studies were on meiosis in basidia and structure of spore. They didn't contain the genus *Entoloma*. The spores of the genus *Entoloma* are multi-angular and they have five kinds of form, which are isodiametrical, hetrodiametrical, nodulose, cuboid and cruciform.

A hypothesis was presented on the process of the spore formation in the *Rhodophyllus*(synonyum of *Entoloma* : Romagnesi, 1978). This study investigates in detail the development and the structure of the spore in *E. violacobrunneum* with scanning electonic microscope and reevaluates the existing hypothsis of spore development in the *Entoloma*.

Materials and Methods

Carpophores of *Entoloma squamiferrum* were collected at Mt. Naejang National Park on 20, July 1990 and dried under the sun and in the shade. The fragments of lamellae of fresh carpophores were fixed 2.5% paraformaldehyde−glutraldehyde(pH. 7.2). These were washed with phosphate buffer(pH. 7.2). They were fixed 2% osmium(O_5O_4) again and were washed with phosphate buffer(pH. 7.2). These were dehydrade with acetone series and dried for 24 hours naturally. These materials were 150Å of Au−coating with Ion Coater (Eiko IB−3) and scanning electrinic microscope(ISI−SS40) was used for observation.

Results and Discussions

Four sterigmata which are papillate(Fig. 1−A) are developed form bottom of crator−shaped basidium(Fig. 1). Margin and bottom of the basidium are uneven.

The paillaform of sterigma is 0.8㎛ in diameter(Fig. 1−A). The basidium is 4.2−5.5㎛ in dia.(Fig. 1−B) The paillaform of sterigmata is swollen to a small globe(Fig. 2−A) and hilum is formed(Fig. 2−B). This is the coincidnce of the hilum formation in sporal development initial of the *Russula*(Burge, 1979). The small golbe sterigma is 0.9×1.1−1.2㎛(Fig. 2−A) and the other sterigma is 1.1㎛ long(Fig. 2). The small globeform is swollen to larger globe(Fig. 3−A, 4−A, 5−A) which is 1.0−1.2×1.2−1.3㎛(Fig. 3). The sterigmata are 0.5−0.7×1.0−1.2㎛(Fig. 3). The bottom of basidium is wrinkled and the bases of the sterigmata are bulbose(Fig. 2,3,4).

Romagnesi(1941, 1978) proposed that two prototypes of spore have different orgines. Firstly when the spore sterigma is oval, it becomes a cube with quadrangles. Secondly when the spore of sterigma is clavate, it become a triangle. When the globeform of sterigma is more swollen to be contacted, the globe spore are irregularly crushed as depression(Fig. 4,6,7). The hilum is more constriction(Fig. 4−B). The globose spore is 1.3−2.0×1.6−2.3㎛(Fig. 4) and sterigma which is 0.7−0.9㎛ long turns slender(Fig. 4). The globose spore is 1.1−1.3㎛ in dia.(Fig. 5).

The globeform is swollen in elongation than in volume to a clubform(Fig. 6). When the clavate spore are contracted during swell, the surfaces of the spores very crushed(Fig. 6−A). The clavate spore is 1.6−2.0×2.5−2.8㎛(Fig. 6). The clavate spore is swollen in volume than in elongation to a elliptical spore. When the apex of the sterigma is swollen to a elliptical form(Fig. 8,9,10), more than six spots of the spore surfaces are randomly depressed(Fig. 8−A,B,C). The depressions of the same spore is irregular(Fig. 7−A,B). The surfaces of spores are rough(Fig. 8). AT first, depression of surfaces is low but it is deeply depressed(Fig. 9,10). When the depression is over, the spore is the heterodiametrical spore of multi−angular, which is 5.0−5.3×7.3−8.7㎛(Fig. 11). The margin of spore is 0.7㎛ wide. Seldomly a spore has an oil globule which is 1.1−1.3㎛ in dia.

摘　要

황보라외대버섯의 담자포자(basidiospore)의 발생은 처음에 젖꼭지 모양의 4개의 병자(sterigma)가 분화구 모양으로부터 발생한다. 젖꼭지모양(papillate)은 차차 조그마한 구형(globe)으로 부풀고 다음에 방망이(club) 모양으로 된다. 그리고 이 방망이 모양이 타원형(elliptical)이 되면 표면의 6군데 이상에서 불규칙 함입이 일어나서 상이한 각(heterodiametrical angle)을 갖는 다각형(multiangular)의 포자(spore)가 된다.

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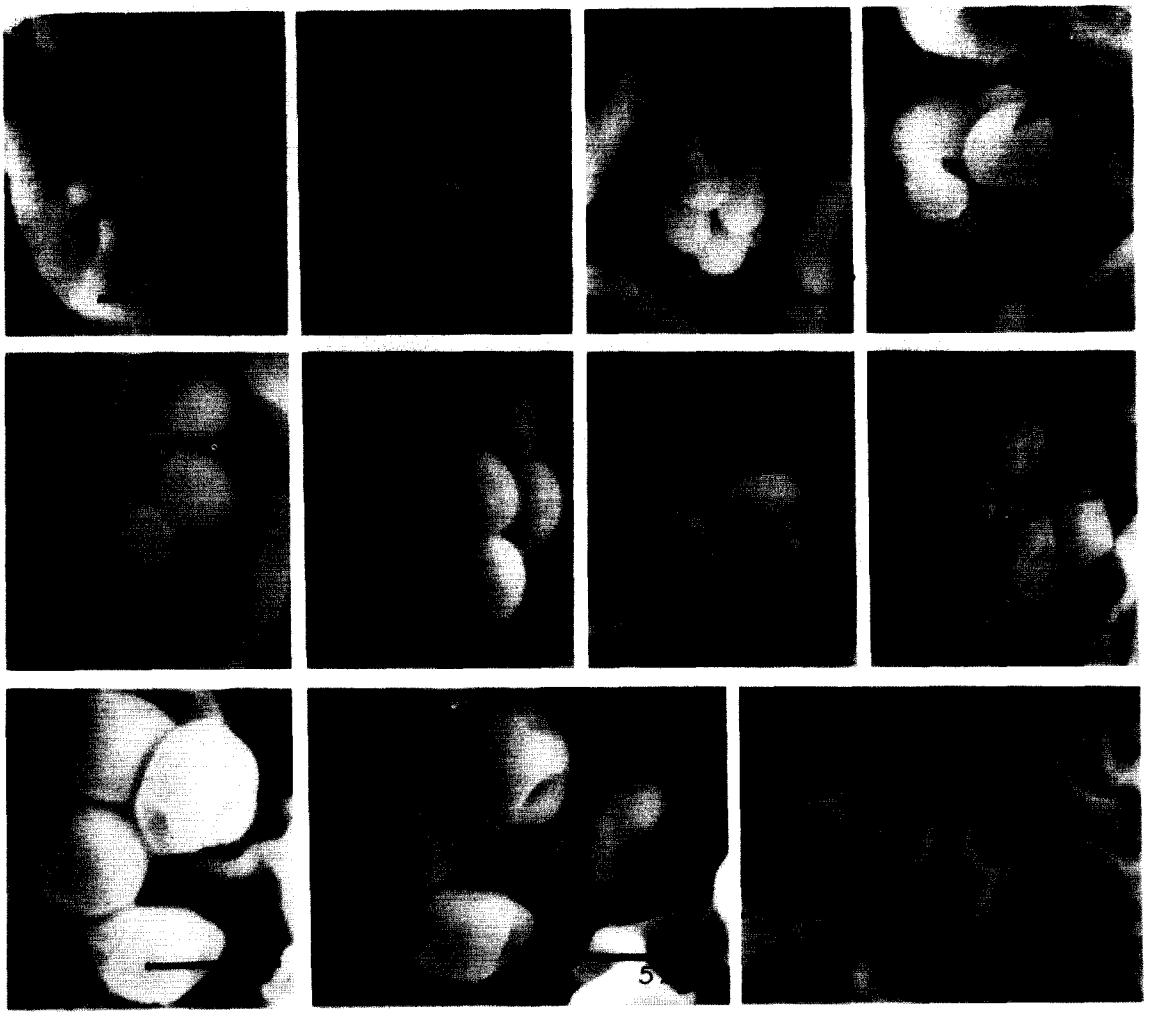

Fig. 1－A, papillate of sterigma, 1－b, margin of basidium
Fig. 2－A, small globe of sterigma, 2－B, hilum
Fig. 3－A, globe of sterigma
Fig. 4－A, globe of sterigma, 4－B, constrication of hilum
Fig. 5－A, globos spore
Fig. 6－A, crushed spore when spore is contacted
Fig. 7－A, low depression, 7－B, deeply depression
Fig. 8－A, rough surface of spore, 8－B, depression
Fig. 8－C, deep depression, 8－D, margin of basidium
Fig.9－10, depression of elliptical spores
Fig.11, heterodiametrical spore, 11－A, oil globule, 11－B, margin of spore.