

## Study on Life Cycle of *Coremiopleurotus* and Its Application in Cultivation

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Beginning with the finding out a giant forming coremium *Pleurotus* sp. in the forest of central highland of Vietnam, studies of morphogenesis and cultivation of this strain has been conducted and then extended to the subgenus *Coremiopleurotus*. Six isolates of *Coremiopleurotus* from USA, Greece, Taiwan, Japan and Vietnam were used. Species identification using ITS rDNA showed that dikaryotic isolates of USA (VT1785), Greece (LGAM P50), Taiwan (ASIK3), Japan (K550) contained homogenous ITSs like other *Coremiopleurotus* ITSs submitted in GenBank, two isolates S396 of Japan and Blao of Vietnam showed special feature when containing of two distinct ITS sequences. Therefore, they were identified to be hybrid strains however their origins are still mysterious.

Processes of arthroconidiation through coremium formation were elucidated. The coremium exclusively produced dikaryotic arthroconidia with the remnant of a clamp connection. Cells in the subapical zone of the hyphal bundle reduced their length by division before arthroconidiation. Approximately 400,000 arthroconidia were produced by a coremium in one day, with constant productivity over a two-week period. Continuous cell extension and division in the coremium stipe supplied cells for arthroconidiation at the coremium apex that is surrounded by a liquid droplet. Maintenance of moisture with coremioliqum was necessary for arthroconidiation. The coremioliqum formation was performed by active liquid transportation in hyphae, a process that was blocked by the microtubule depolymerization agent thiabendazole.

The morphogenesis of toxocyst was also clarified. Toxocysts of the genus *Coremiopleurotus* are blastoconidia-like ovoid structures surrounded by a liquid droplet containing a toxin that paralyzes nematodes. The surface of the liquid droplet was found to be an elastic envelope. When a nematode touched the toxocyst, the envelope adhered to the worm and burst. Toxocysts were induced simultaneously with coremia in the absence of nematodes and developed only from aerial hyphae in which nuclear division had ceased. In the early stage of toxocyst development, liquid sprang repeatedly from tip of the sterigma-like stipe before ovoid formation. A certain substance in the liquid might polymerize to form the envelope while the ovoid simultaneously budded in the droplet. The nucleus tends to locate near the toxocyst, especially in early stage of toxocyst development. Each

dikaryotic cell predominantly formed one or two toxocyst(s) while monokaryotic cells predominantly did one. In rare cases, a nucleus existed in the toxocyst, suggesting the possibility that the toxocyst is a vestigial blastoconidium.

Furthermore, the investigation of convertibility of coremia into basidioma as well as the forming of monokaryotic fruit-body in this study contributed a different idea of the life cycle of *Coremiopleurotus*. It is noted that there was no clear boundary between anamorphic and teleomorphic stages. Life cycle of this mushroom would be divided into two phases: dikaryotic and monokaryotic phases. Each phase comprises the processes of coremiosporulation (conidiation) and basidiosporulation.

Same as the most of other *Pleurotus* spp., *P. cystidiosus* subsp. *abalonus* (Vietnamese strain Blao) is easily cultivated on sterilized substrates of several agro-forestry wastes such as rice straw, corncob, corn straw, rubber tree sawdust and sugarcane bagasse. Other supplements as calcium carbonate and rice bran were examined in order to improve the production of fruit-bodies. In the other hand, examination of the textural changes of *P. abalonus* fruit-body during storage time and the relationship between substrate components and texture had been done by using four characters of toughness, brittleness, tenderness and pliability. While all of four characters changed significantly after 6 day storage period at 20°C, no significant textural changes after 8 day storage at 10°C and only two characters of texture, tenderness and brittleness showed the different which depended on the changes of substrate components.

