



### 大雪兰种子的共生培养研究

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### Symbiotic seed germination of *Cymbidium mastersii* Griff.ex Lindl

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**摘要** 为了促进大雪兰种子的快速萌发,筛选能有效促进大雪兰(*Cymbidium mastersii* Griff. ex Lindl.)种子共生萌发的菌根真菌,在兰-菌共生培养条件下,开展了共生种子萌发后的生物量、菌株重分离、三维菌丝网光学和电子显微镜观察,以及TTC种子活力等方面的测定.经研究表明:经过150 d兰-菌共生培养,2种春兰和墨兰根部的菌根真菌CLB111、MLX102均对大雪兰种子共生萌发有明显的促进作用,萌发率与对照均达到极显著差异.经共生培养后从种子中重分离获得原接种菌株;共生萌发种子经光镜及电子显微镜观察到大量菌丝侵入并在胚细胞中形成三维菌丝网,胚开始分化,种子表现出明显的活性;而对照组种子经重分离未获得原接种菌株、未发现菌丝侵入种子,且种子活力极低.由此,筛选出促进大雪兰种子萌发的有效菌株为CLB111、MLX102.大雪兰成株的菌根真菌与其种子共生萌发的菌根真菌是一致的,这与天麻不同;同时,能有效促进大雪兰种子萌发的菌根真菌有2种.试验表明,大雪兰的菌根真菌与促进种子共生萌发的菌根真菌不是绝对专一的,在一定条件下,不同的菌株对同一种大雪兰种子有明显的促进萌发作用.对于不同的生态条件下是否存在有差异性的问题,有待进一步研究探讨

**关键词:** 大雪兰 菌根真菌 共生体系 三维菌丝网 种子活力

**Abstract:** In order to screen mycorrhiza fungus that can promote the seed germination and form the symbiosis with *Cymbidium mastersii* Griff.ex Lindl and scale produce high quality seedling,we first symbiosis cultivated seeds with different fungi in the medium of cortices symbiotic culture,then measured the biomass of seedlings,re-separation of fungus strain,studied the 3D hypha net by using the optical microscope and electron microscope,and determined the seed vitality with TTC method.The results showed that strain CLB111 and MLX102 that were separated from roots of *Cymbidium goeringii* Rchb.f.and *C.Sinense* Willd can promote the seed germination of *Cymbidium mastersii*.The differences of germination rates between treatments with strain symbiosises and control were significant.Re-separations from the culture medium confirmed the strains in symbiosis roots were the same as the inoculated strains.The optical microscope and electron microscope observation found that many fungus hypha infected into embryo cell and formed the 3D hypha net,and the embryo started differentiation.TTC measurement showed that the seed had high vitality.No strain was found by re-separation from culture medium,no hypha was observed and very low vitality under control treatment.Thus,It can be concluded that strain CLB111 and MLX102 can form the symbiosis and promote the seed germination of *Cymbidium mastersii*.The experiments found the fungus separated from adult orchids and the fungus that promote the seed germination were the same strains in *Cymbidium mastersii*.This phenomenon was different from the *Gastrodia elata* Blume.It was also confirmed that funguses that can form symbiosis with and promote the seed germination of *Cymbidium mastersii* were not absolutely specific.Under certain condition,different strains can significantly promote germination of one orchid species.It may need further investigation to verify the differences under different ecological conditions.

**Key words:** *Cymbidium mastersii* Griff.Ex Lindl Mycorrhiza fungus symbiosis system 3D hypha net seed activity

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