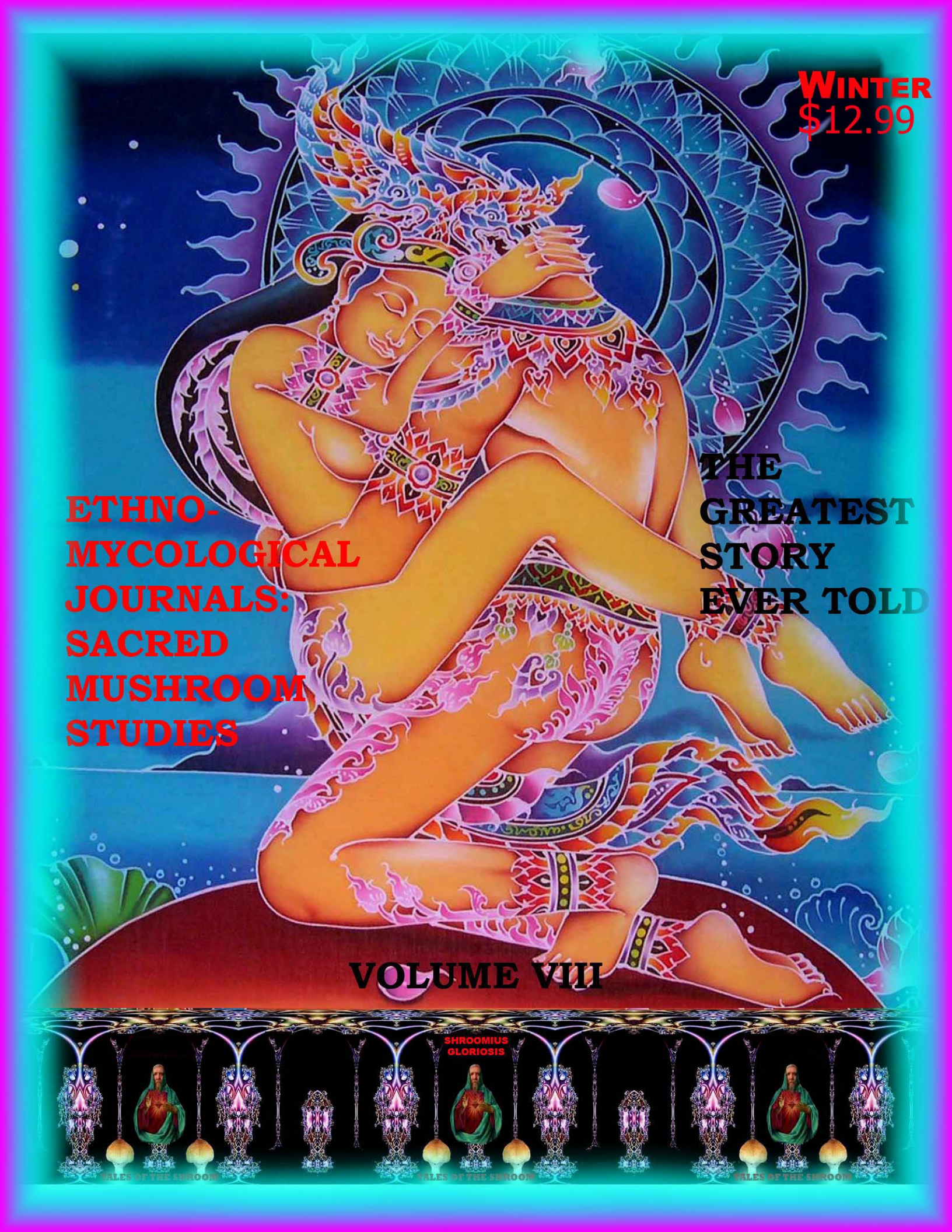
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ETHNOMYCOLOGICAL JOURNALS:

SACRED MUSHROOM STUDIES VOLUME VIII

EDITED BY

JOHN W. ALLEN

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Full Moon Mushroom Dream Festival on Koh Phanghan, Thailand.

The Occurrence, Recreational Use, Cultivation, and Chemistry of Psilocybe ovoideocystidiata, a new Bluing Species (Agaricales) from Ohio, Pennsylvania and West Virginia

By

Allen, John W. [1], Gartz, Jochen. [2], Sihanonth, Prakitsin[3] and Dan Molter[4].

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Abstract

Cultivation and analysis of *Psilocybe ovoideocystidiata, a* new bluing species from Ohio and Bethany West Virginia is presented. Cultivation of this species was demonstrated on hardwood substrate. Analysis of both caps and stems revealed the presence of psilocybin, in most cases psilocin and always low concentrations of baeocystin. Psilocybin, psilocin and baeocystin levels varied in the bluing caps and stems of this new species. The highest concentrations of these alkaloids were found in both naturally grown and cultivated fruiting bodies of *Psilocybe ovideocystidiata* which, at the present moment is an indigenous species found in Ohio, Pennsylvania and West Virginia.. The relative alkaloidal content of psilocybin, psilocin and baeocystin found in *Psilocybe ovoideocystidiata* from Ohio was similar to that measured in *Psilocybe caerulipes* by Leung *et al*. Recent comparative chemical analysis of both species was unable to be performed due to a denial of specimens through the University of Michigan's herbarium.

KEYWORDS: *Psilocybe ovoideocystidiata*, *Psilocybe caerulipes*, cultivation, psilocine, psilocybine, baeocystine, Ohio, West Virginia, Pennsylvania.

Indoor Cultivation of *Psilocybe ovoideocystidiata.*

Introduction

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Recent ethnomycological studies from 2006 confirmed earlier reports that a new species of psychoactive agaric was reported in 2003 from mid-eastern North America (Guzmán, Gaines and Ramírez-Gullén, 2007).

At the moment there appears to be some confusion amongst amateur mycologists that *Psilocybe ovoideocystidiata* is conspecific with *Psilocybe caerulipes*, a mushroom described first by Peck in 1892, 1887; (Peck) Sacc. (1912). And even more collections were later identified by Singer and Smith (1958), Smith (1978), Lincoff (1978), Guzmán (1983) and Stamets (1996) as *P. caerulipes*. Currently, there were only two known photographs of *P. caerulipes* available to the public for use in identifying the species. The first appeared in black and white in Alexander H. Smiths, "*Field guide Mushrooms of the Eastern United States* (Smith, 1978)." Later, the president of the North American Mycological Society, editor Gary Lincoff posted a colored photograph in the "*National Audubon Society Field Guide to North American Mushrooms,*" and Paul Stamets then incorporated that exact same photograph into his 1996 book, "*Psilocybin Mushrooms of the World*."

In late may of 2003, one of the authors of this study (JWA) was sent three photographs of a mushroom found in a wood chipped mulch-bed in a downtown garden in Cleveland, Ohio. The three specimens in the photograph bore a slight macroscopic similarity to that of *Psilocybe cyanescens*, a potent cold weather species common to the Pacific Northwest United States. On the other hand, this newly discovered collection of the Ohio mushrooms bore certain macroscopic characteristics similar to those attributed in the identifications of *P. caerulipes* as identified by Lincoff (1981) and Stamets (1996), but the May to August season described by those above noted authors in their guides were entirely contrary to the seasonal appearance of *P. caerulipes* in the fall

to winter months of October to December.

In the fall of 2003, by using Gary Lincoff's, "*Audubon Field Guide*" and Paul Stamets', "*Psilocybin Mushrooms of the World*," JWA accidentally misidentified the newly discovered species of P. *ovoideocystidiata* as *P. caerulipes*. Between 2003-2009, numerous collectors of this species in Ohio, Pennsylvania and West Virginia all looked at their collections of *Psilocybe ovoideocystidiata*, and began to refer to them as "blue foot,) an epithet normally associated with *P. caerulipes.* Additionally, that name appears in many of the University of Michigan's herbarium collections of *P. caerulipes.* This macroscopic misidentification by JWA; in turn, added to the already concerned confusion surrounding the correct identification between the two species, and that in turn, caused hundreds, perhaps thousands of new collectors of these two different mushroom species the belief that they were both one and the same species. And now both species are referred to locally in Ohio, Pennsylvania and West Virginia as the "blue foot" mushroom.

Methodology

Between 2003-2007, numerous collections of *P. ovoideocystidiata* were harvested in Ohio, Pennsylvania and West Virginia and were misidentified on the WWW at several mushroom web sites as *P. caerulipes*. As noted above, one of the authors of this study (JWA), previously misidentified a 2003 collection of *P. ovoideocystidiata* as that of *P. caerulipes.* This caused numerous amateur mushroom hunters into misidentifying this new species as that of *P. caerulipes,* basing their identification on the senor authors macroscopic identification of that species.

Fig. 1. I*n vitro* grown specimens of *Psilocybe ovoideocystidiata*.

In this study, we attempted to obtain a few small collections of *P. caerulipes* from the University of Michigan's herbarium to study them for comparative chemical analysis of their indolic content with that of *P. ovoideocystidiata*. However, permission was approved and then denied to us by the University of

Michigan's head spokesperson of their herbarium department saying that at this present time they would not be able to loan us the promised specimens for chemical analysis and for SEM photography.

Spores of the materials studied by us were obtained by one of the authors of this study, a very avid entrepreneur of edible fungi cultivation who is known locally in the near northeast as Mushpuppet who contributed some of the material used in this study. The spores of his collections were studied and measurements ranged around 7.7-10.0 micrometers in length, which is in good agreement with the published range for *Psilocybe ovoideocystidiata* of (7) 8-9 (12) micrometers.

Fig. 2. Spores of *P. ovoideocystidiata*, courtesy of Workman, Spore Works Labs.

Fig. 3. Bluing in *P. ovoideocystidiata*, Bethany, Ohio.

Fig. 4. Cheliocystidia, Spores, Basidium, and Pleurocystidium of *P. ovoideocystidiata*.

Fig. 5. Fresh fruiting bodies of *Psilocybe ovoideocystidiata*, Bethany, Ohio.

Figs. 6 and 7. Fresh Specimens of *Psilocybe ovoideocystidiata.*

Indoor Cultivation of *P. ovoideocystidiata* by Means of Transfer.

This is really more an intuitive than scientific experiment, and quite frankly we were surprised it worked. Using methods employed by a member of an Internet mushroom website blogger named, Mushpuppet, we were able to bring to fruit, a beautiful harvest of *P. ovoideocystidiata*.

P. ovoideocystidiata fruits in the spring from late April to early June. Its natural habitat is woody debris buried in sandy loam along streams and riverbanks.

This grow is an attempt to simulate a hard winter, followed by a spring thaw, which produces a flood, which picks up colonized wood, and buries it in the mud accumulating along the stream bank.

It was a very mild winter in 2005. We did have a few freezing days in early December, but since then the mercury has rarely fallen below freezing.

We first collected the wild mycelium and put it in the freezer in a plastic bag. The next morning, when we removed it from the freezer, it was frozen solid; in fact, we had concerns that we may have damaged or killed the mycelia, but figured out that if it could survive being frozen in the wild, then perhaps it could survive in the freezer.

A collection of frozen mycelium was gathered and bagged up, as was a large bag full of the muddy sandy-like soil from along the riverbank where we collected the mycelia of *P. ovoideocystidiata.*

For this next step we used glad-ware dishes for use with the substrate of the muddy-river soil. To insure good drainage, similar to that of the wild, we melted twenty holes in the bottom of each of the glad-ware dishes by hitting a nail with a candle and then striking it through the bottom. We then put about an inch of river sand/mud in the bottom of each dish, followed by about an inch of frozen colonized woodchips/branches, twigs, etc. Then we cased the top of each glad-ware container with another ½ inch of sandy mud.

Figs. 8 and 9. Indoor cultivated specimens from transplant of *P. ovoideocystidiata.*

Fig. 10. A cake of hardwood chips that has produced a good indoor crop of fresh *Psilocybe ovoideocystidiata.*

Next we gave it a thorough soaking with cold tap water to wash the loose mud into the many empty spaces around the substrate. Then we placed the dishes into a larger tub humidified by wet orchid moss This probably worked better than with perlite because it covered more surface area), and we were able to preserve it at room temperature near a window; often fanning and misting the tub and glad-ware containers at least several times a day. Within ten days we were finally able to see some results of our experiment as several pins began to appear.

Workman of Spore Works Labs reported it as a "very nice grow." He further noted that *P. ovoideocystidiata* bore a slight macroscopic resemblance to that of *Psilocybe stuntzii*, basing his

observations on Dr. Gastón Guzmán's taxonomic description of *P. ovoideocystidiata* (Guzmán, 2007), including the presence of a persistent annulus in the species. Workman also noted that, "the partial veil is thicker than the veil reported for *P. caerulipes*, which is typically thin and nearly invisible as an annular zone after it breaks," adding that he noticed that it looked "more similar to *P. stuntzii*" and reminded us that, "cultivated specimens can vary significantly from natural specimens."

Fig. 11. A crop ready for harvest. Mature fruiting bodies of *P. ovoideocystidiata.*

Fig. 12. Observe the intense blue oxidation of psilocine as age attacks the flesh.

Chemical Analysis of *Psilocybe ovoideocystidiata*.

Mushroom masses (dry weight)		psilocybin (%)	baeocystin (%)	psilocin (%)
1		0.693	0.20	0.05	-
2		0.172	0.41	0.10	0.1
3		0.146	0.42	0.05	-
4	cap	0.165	0.62	0.10	0.10
	stem	-	0.45	-	-
5	cap	0.155	0.58	0.05	-
	stem	-	0.21	0.03	-
6	cap	0.110	0.75	0.05	0.20
	stem	-	0.43	0.03	-

Again, we see a higher concentration in the smaller mushrooms and suggest that the low amount of psilocin detected in this species is the result of decomposition of psilocin in handling and drying.

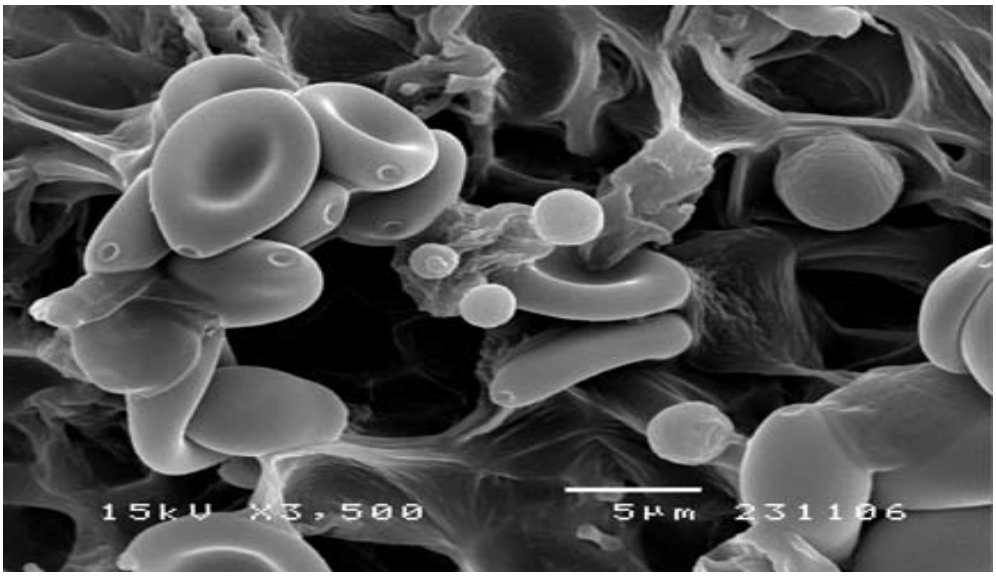

Fig. 13. An SEM at 3,500 X of *P. ovoideocystidiata*. Photo: Prakitsin Sihanonth.

Herbarium Deposits of *Psilocybe ovoideocystidiata*

Specimens of *Psilocybe ovoideocystidiata* studied by Gastón Guzmán were deposited in (XAL).

1) Molter, summer 2006 from Ohio
2) Molter, summer 2006 from Ohio
3) Molter, summer 2006 from West Virginia.

Guzmán also reported that he has "other unstudied collections from Molter which were gathered in Ohio and West Virginia." Additional collections from 2006 by Dan Molter [and JWA] are on deposit at (Chula) in Bangkok, Thailand and in the herbarium at the University of Leipzig, Germany.

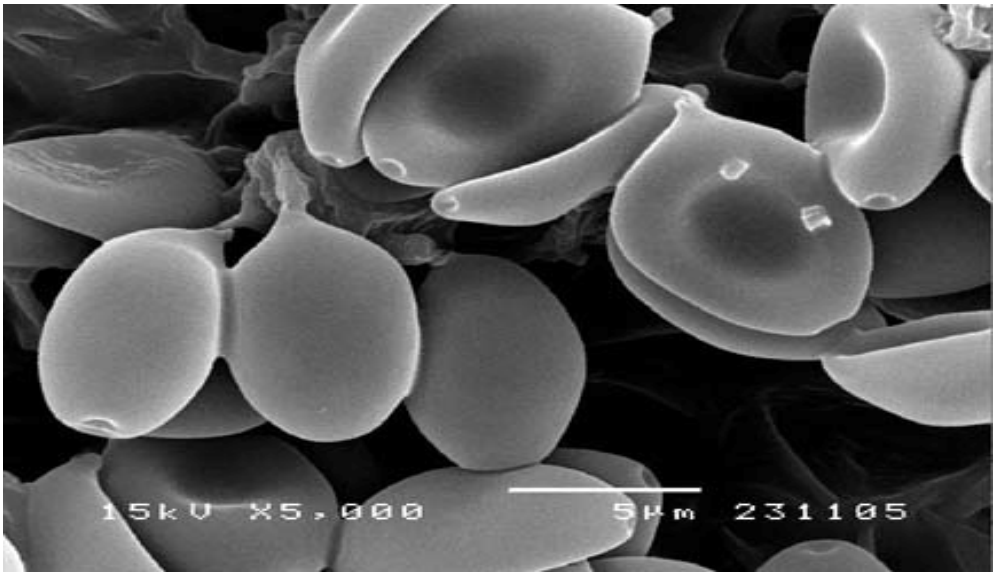

Fig. 14. An SEM at 5,000 X of *P. ovoideocystidiata*. Photo: Prakitsin Sihanonth.

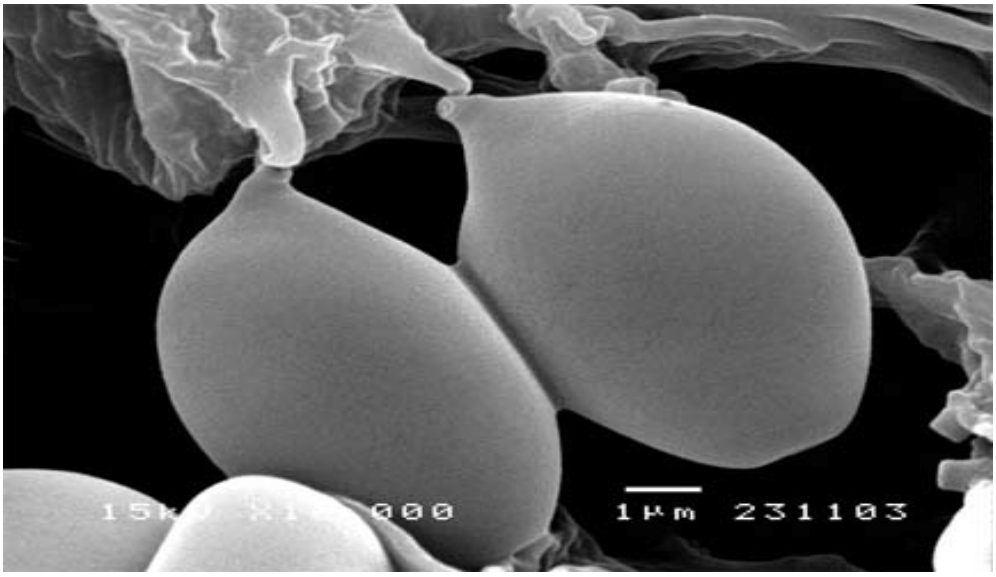

Fig. 15. An SEM close-up of above image at 10,000 X of *P. ovoideocystidiata*. Photo: Prakitsin Sihanonth.

Discussion:

Observations of this species, in both the naturally occurring specimens, as well as those cultivate indoors, we found that the veil remnants remained as the stem grew 2-3 inches above the veil after it had broken open. In *Psilocybe stuntzii*, *Psilocybe fimetaria*, *Psilocybe sierrae*, as well as *Psilocybe cubensis*, the veil always remains very close to the opened

cap. It can be observed in the above photos that this is a rarity in the genus *Psilocybe*. And this feature was not noticed or reported by Guzmán (2007) in his study of this new species.

Regarding the quest to perform comparative analysis of *Psilocybe ovoideocystidiata* with that of specimens of *Psilocybe caerulipes*, the senor author had gained legitimate promise for a loan of herbarium specimens from the University of Michigan's herbarium loan department. On May 3rd of 2007, while working through the Department of Microbiology at Chulalongkorn University in Bangkok, the authors had been approved and promised, a few collections of *P. caerulipes* for our research, by Dr, Patricia Rogers (2007), Collection Manager, of the MICH Fungus & Lichen Collections.

However, by April 4th of 2008, the administrator of the University of Michigan's herbarium informed the senor author of this study (JWA), that they had been advised by their legal counsel, they would be unable to send any of their *Psilocybe* specimens for loan at the present time (Rabeler, 2008).

Although we had received written permission for the use of herbarium material by Dr. Rogers, No reason was provided to any of us authors as to why we were later denied this permission by a separate party from the herbarium, so we were not able to conduct a comparative chemical and taxonomical analysis between the two species.

Additionally, mycologist and cultivator, Paul Stamets, in his field guide, "*Psilocybin Mushrooms of the World"* (1996), erred in noting on page 105 in his field guide that *P. caerulipes* is "moderately active; no analysis published." However, in 1965, Leung *et al*. reported the presence of both psilocine and psilocybin in *Psilocybe caerulipes*.

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Fig. 16. Fresh properly dried specimens of *Psilocybe ovoideocystidiata.*

Reported Dosage: 2-3 dried specimens of approximately the size represented in Fig. 16.

This is suppose to be a journal with no outside advertising but I am pleased to announce that coming soon from our shroomy Canadian neighbors, the very same cool folk who brought shroomtalk.com to the world, a new mushroom fanzine soon to be available only online for amateur mushroom enthusiasts, from mycozine.com.

And to everyone: Have a Shroomy Day.

Terence McKenna and John W. Allen by Psychonaut.

John W. Allen. October 31, 2009

COSMIC ORGASM by Designed by JOHN ALLEN

ACKNOWLEDGMENTS

Art contributions include hand-painted batik and t-shirts designed by John W. Allen, and painted by Adisron Junlawanno (Mr. Samui) of Ban Chewang and Wipaporn of Ban Nathon, Koh Samui, Thailand. Mushroom Poster of Terence McKenna and John W. Allen (courtesy of Psychonaut, the Shroomery). Photographs: Timothy Leary and John W. Allen by Ron Piper; R. Gordon Wasson and John W. Allen by Michael Aldridge; Andrew Weil and John W. Allen by Mark D. Merlin; Microphotographs of SEM: by Prakitsin Sihanonth (Chulalongkorn University), Bangkok, Thailand and spore images and Albino Penis Envy photo by Workman (Spore Works Labs), USA; *Psilocybe ovoideocystidiata* (Ohio) by Dan Molter and Mushpuppet; *Psilocybe villarrealiae* (Jalisco, Mexico) by Fulvio Castillo Suarez; *Psilocybe semilanceata* by Pilze (Austria); John W. Allen, Sasha Shulgin and Jochen Gartz by Troy Donohue. All other graphic images and photographs are by John W. Allen. Blurbs, courtesy of Stanley Krippner, Tjakko Stijve, Paul Krassner and David Jay Brown.

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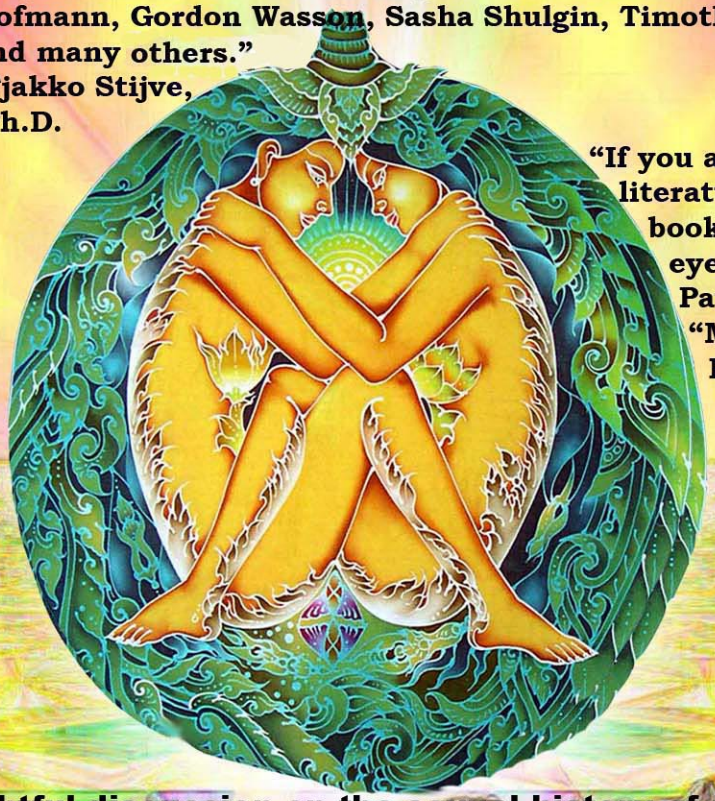

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