

TWO SPECIES REPRESENTING A NEW GENUS OF MICROASCACEAE, FROM VENEZUELA

Dos Especies Representando un Nuevo Género de Microascaceae, en Venezuela

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ABSTRACT

During a continuing study of coprophilous fungi in Venezuela, a new genus, *Lophotrichus*, including two species *L. ampullus* and *L. bartlettii*, is described, which has certain characteristics of the microascaceae pyrenomycete with two germ pores. The two described species of this genus are discussed here: *Lophotrichus ampullus* isolated from goat, fox, hen, dog, turkey, horse, cow, calf, and turtles dungs, *L. bartlettii* from horse, calf, donkey, rabbit, fox, hen, cat and deer dungs. These two identified species represents new records for Venezuela.

Key words: *Lophotrichus*, coprophilous fungi, perithecia, hair.

RESUMEN

Durante un estudio continuo de hongos coprofílicos en Venezuela, un nuevo género con dos especies *L. ampullus* y *L. bartlettii*, son descritos, con ciertas características de los Microascaceae Pirenomicetes con poros germinativos. Las dos especies descritas de este género son discutidas aquí: *Lophotrichus ampullus* aislado de heces de cabra, zorro, gallina, perro, pavo, caballo, vaca, becerro y tortuga. *L. bartlettii* de heces de caballo, becerro, burro conejo, zorro, gallina, gato y venado. Estas dos especies identificadas representan nuevos registros para Venezuela.

Palabras clave: *Lophotrichus*, Hongos Coprofílico, peritecio, pelo.

INTRODUCTION

Members of the microascaceae, is reported in previous studies of this family pyrenomycetes [5] are considered to be

saprobic and they are found predominately on dung. The ascospores of this fungus consist of ascospores with two germ pores and extruded in a mass or as cirrhi. According Benjamin the characteristics of the perithecial wall, the evanescent asci and light-colored spores, the appendages surrounding the ostiole of the perithecium, and the manner in which the ascospores are discharged in the form of an elongate cirrus suggest a relationship to the genus *Chaetomium*. He made an examination of the monographs by Benjamin and Tschudy has indicated that neither of these species could be assigned to this genus or any related genera in the family Chaetomiaceae. In a monograph of *Lophotrichus*, Seth emended the genus and described a new species. He proposed the family Lophotrichaceae for this genus and placed it in the Microascales, nothing that its production of irregular asci excluded it from the Chaetomiales. A comparison of centrum development in *Lophotrichus* [23] and in *Microascus*, clearly indicates that these taxa cannot be placed in separate families. The genus *Lophotrichus* comprises five species from the world: *L. ampullus* Benjamin, *L. martinii* Benjamin, *L. brevisrostratus* Amis, *L. bartlettii* Malloch and *L. sp* Seth [21].

MATERIALS AND METHODS

Collection and incubation of the samples

During a study of coprophilous fungi in 2001 in 17 municipalities of Zulia state, Venezuela, were collected 250 animal dung samples to determine the appearance of coprophilous fungi. The sample dungs was proceed of domestic and wild animal.

Those were goat (*Capra hircus*), fox (*Vulpes vulpes*), hen (*Gallus domesticus*), dog (*Canis familiaris*), turkey (*Meleagris gallopavo*), horse (*Equus caballus*), cow (*Bos taurus*), deer (*Cervus elaphus*), cat (*Felis catus*), rabbit (*Sylvilagus spp*)

and turtles (*Testudo graeca*) dungs. Procedures for collecting and inducing ascomal formations in the sample dungs were similar to those described by Bell, Benjamin, Malloch and Malloch and Benny. Sample of dung that appeared to be relatively recent and unweathered were collected, intermittently from June 2000 to May 2001 into clean receptacles and usually set to incubate within a day or four of collection. If samples could not be incubated shortly after collection they were gently air-dried stored in paper envelopes until incubation [20]. In the laboratory each dung were placed in a moist chamber if the dung is very dry on collection it should be moistened. But if made to wet, fungal grow was inhibited and after seven days at room temperature (20-24°C) yielded numerous perithecia. The fungus was then mounted in water and studied with a light microscope, measurements and drawings of the various structures were made and photographs also were taken on a Leitz microscope with an automatic camera, attempts to obtain the fungus in pure culture were unsuccessful [2, 3, 8, 9, 10, 11, 14, 15, 16, 17]. The Venezuelan material has been accessioned in the herbarium of the Departamento Fitosanitario, Facultad de Agronomía, Universidad del Zulia, Maracaibo, Venezuela (HERZU).

RESULTS

Lophotrichus ampullus Benjamin

Perithecia black, globose, 160-240 µm in diameter, partially superficial or immersed with dark, rhizoid-like mycelia on submerged parts or lateral hairs in the form of colorless septate aerial hyphae on superficial portions up to 150 µm long, 2-3 µm in diameter at base; wall thin, membranaceous, necks usually one or two on a perithecium. Terminal hairs surrounding the ostiole are numerous, long, septate thick walled, straight or contorted, up to 1.7 mm long, 3.7-4.2 µm in diameter, walls 0.60-1.12 µm thick, dark smoky in color, more or less densely encrusted, tips curved to circinate. Asci subglobose to broadly clavate and short stalked, colorless, 10-18 x 20-30 µm, evanescent, 8 spored, paraphyses lacking. Ascospores extruded in a mass or cirrus, frequently up to 1.5 mm in length, bright copper-colored in mass, colorless or hyaline, lemon-shaped, apiculate, thin walled, 6-10.2 x 5.5-7.5 µm, germinating at both ends anamorph state none reported. Isolated dung collected near: Perijá, Lagunillas, Mara, counties, Zulia state in 2001, FIG. 1.

Lophotrichus bartlettii. (Masee & Salmon) Malloch & Cair

= *Magnusia bartlettii*. (Masee & Salmon)

= *kernia bartlettii*. (Masee & Salmon) Benjamin

= *Lophotrichus breviostratis*. Ames

Perithecia black globose, 250-320 µm in diameter partially superficial or immersed in the substrate, short necked. Ascocarp with terminal straight hairs, up to 1.5 µm long, black septate surrounding the ostiole. Asci elongated with short stalked, colorless, 10-25 x 20-30 µm, 8 spored, paraphyses

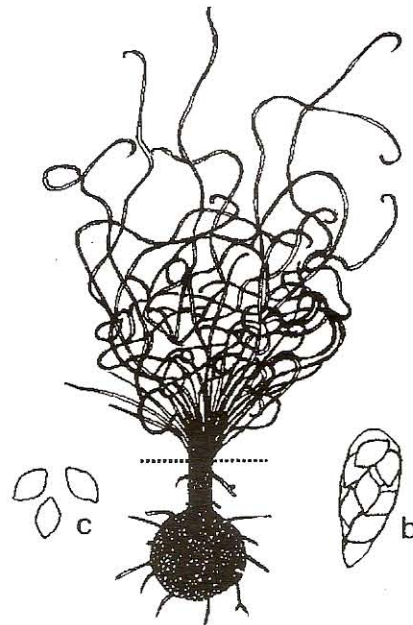


FIGURA 1. *Lophotrichus ampullus*. a, PERITHECIUM b, ASCI c, MATURE ASCOSPORE

lacking. Ascospores without septa, somewhat limoniform, often sublimoniform, hyaline or very pale extruded in coppery tendrils 6-7.5 x 5-5.5 µm, thin walled, 5.5-9.6 x 5.3-7 µm, germinating at both ends and lacks an anellophore conidial state. Isolated dung collected near: Maracaibo, Mara, Lagunillas, Ciudad Ojeda, Counties, Zulia state in 2001. FIGS. 2 y 3.

DISCUSSION

As with most coprophilous Ascomycetes, the biology of *Lophotrichus ampullus* is poorly understood, Benjamin. State that the micelium fungus on dung agar developing rapidly, remaining white submerged rarely with aerial hyphae; perithecia forming in 3-5 days, maturing in 2-3 weeks. Based on our observations, perithecial development takes 10-12 days, this contrasts with the indicated by Benjamin. Such variations may reflect differences in the age and condition of the materials sampled. As the author Benjamin that the fungus seems to belong mainly to cool temperature and subtropical regions. However, it has been reported from Canada, Germany, Illinois, Michigan, Peru, Kansas, Virginia and northern South America [8, 9, 10, 11, 12, 21, 22]. This represents the first report of the genus *Lophotrichus* with its two species in Venezuela. It appears to occur preferentially on the dung of domesticated animals, including cow, calf, horse, donkey, goat, dog, cat, rabbit, hen and turkey, also wild animals such as: turtles, deer, and fox; but this may be an artifact of the collecting habits of mycologist rather than a natural phenomenon.

Benjamin State that the most important differences is the segregation of the *Lophotrichus* group, comprising about five species known, additional species described by Morinaga.

Their spores extruded as a cirrus, bright copper colored in mass, hyaline, lemon-shaped, tips thin-walled, germinating at both ends when mature, a majority of the terminal hairs of *Lophotrichus ampullus* are a millimeter or more in length. Some are highly contorted so that they form a loose tangle about the ostiole while many others are nearly straight or only slightly curved. These hairs extend up ward and outward above the substrate and have tips, which are usually curved to circinate, seldom straight. By the time the ascospores have been discharged into the terminal hairs the neck has become extremely brittle slightly below the ostiole so that the least disturbance frees the mass of hairs and spores for subsequent dispersal. Perithecia of *L. ampullus* may develop two necks rarely more, but this occurs in a very small percentage of ascocarps. The terminal hairs of *L. bartlettii* are distinctly different from *L. ampullus*. The majority of them are relatively apically straight. The perithecia of *L. bartlettii* develop one neck, and the number of such ascocarps. May reach 20 per cent in samples. *Kernia bartlettii* differs in having nonostiolate ascomata as with other species of *Lophotrichus*, *K. bartlettii* grows faster than *Kernia* species, produces elongated asci and larger ascospores with prominent germ pores, and lacks an annellophore conidial state. *K. bartlettii* appears to be identical with *L. bartlettii*. Ames, and represents an older names for that species, hence the following new combination must be made. The collection of *K. nitida* illustrated by Masee y col.. appears to be a collection of *Lophotrichus bartlettii* with apically circinate ascocarp appendages. We have occasionally observed apically circinate appendages in cultures of *L. bartlettii* but this characteristic appears to be less common than straight hairs. In a monograph of *Lophotrichus*, Seth emended the genus and described a new species. He proposed the family Lophotrichaceae for this genus and placed it in the Microascales, noting that its production of irregular asci excluded it from the chaetomiiales. A comparison of centrum development in *Lophotrichus*, Whiteside and in *Microascus*, Corlett, clearly indicates that these taxa can not be placed in separate families. Therefore, Benny y col.. are retaining *Lophotrichus* in the Microascaceae. The more or less submerged habit of the perithecia and typical long necks are departure from the usual concepts held for the Microascaceae. After comparison of the Venezuela material with published species described by Benjamin, Benny and Malloch, its were identified as *L. ampullus* and *L. bartlettii*.

CONCLUSIONS

A new genus for Venezuela, *Lophotrichus*, including two species: *L. ampullus* and *L. bartletti*, is described, which has certain characteristics of the *Chaetomiaceae*. The two species described species of this genus produce perithecia which, when grown in the substrate, are partially or entirely submerged, possess long necks, and have elongate, thickwalled terminal hairs restricted to the area immediately around the ostiole. Ascus characteristics are essentially the same as in the genus *Chaetomium*.

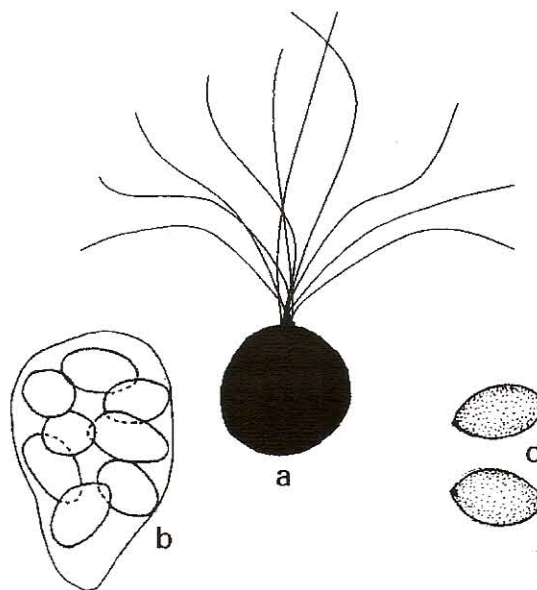


FIGURA 2. *Lophotrichus bartlettii*. a, PERITHECIUM b, ASCI. c, MATURE ASCOSPORE.

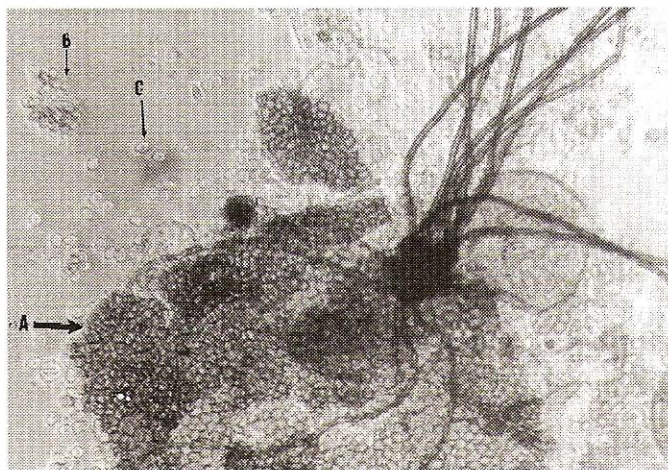


FIGURA 3. *Lophotrichus bartlettii*. A, PERITHECIUM B, ASCI. C, MATURE ASCOSPORE. 40X.

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