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**GASTROCYBE IBERICA SP. NOV. IN SPAIN
(BOLBITIACEAE, AGARICALES) ¹**

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SUMMARY — A new species is proposed, *Gastrocybe iberica*, characterized by its non-anastomosing lamellae, hymeniform cuticle with abundant pileocystidia and its bisporic basidia. It has been collected abundantly in hygrophytic meadows with *Populus alba*, among *Poaceae* sp. and in meadows of *Hordeion leporini*.

RÉSUMÉ — Nous proposons comme nouvelle espèce *Gastrocybe iberica*, qui est caractérisée par ses lames non anastomosées, sa cuticule hyméniforme avec d'abondants piléocystides et ses basides bisporiques. Cette espèce a été récoltée en abondance dans des prairies hygrophytes sous *Populus alba*, entre des *Poaceae* sp. et dans des prairies d'*Hordeion leporini*.

RESUMEN — Se propone *Gastrocybe iberica* como una especie nueva para la ciencia caracterizada por sus láminas no anastomosadas, su cutícula himeniforme con abundantes pileocistidios y sus basidios bispóricos. Ha sido recogida muy abundante en praderas higrófilas de *Populus alba* entre *Poaceae* sp. y en praderas de *Hordeion leporini*.

KEY WORDS : Taxonomy, *Gastrocybe*, Bolbitiaceae, Basidiomycotina.

The genus *Gastrocybe* was created by WATLING (1968) for a gastromycetoid fungus, *G. lateritia* found in America, of which WATLING & al. (1966) later extended its chorology to Europe (Italy and Spain). The second species described up to date was found in North America, *Gastrocybe deceptiva* Baroni, and only the typus collection is known ; BARONI (1981) created this taxon based on the material collected by BARTHOLOMEW in 1896.

This genus is very close to *Galeropsis* Velen. & Dvorak in Velen. but they both mainly differ in the structure of the cuticle which is a hymeniform pileipellis in *Gastrocybe*, and a cutis with filamentous hyphae in *Galeropsis*.

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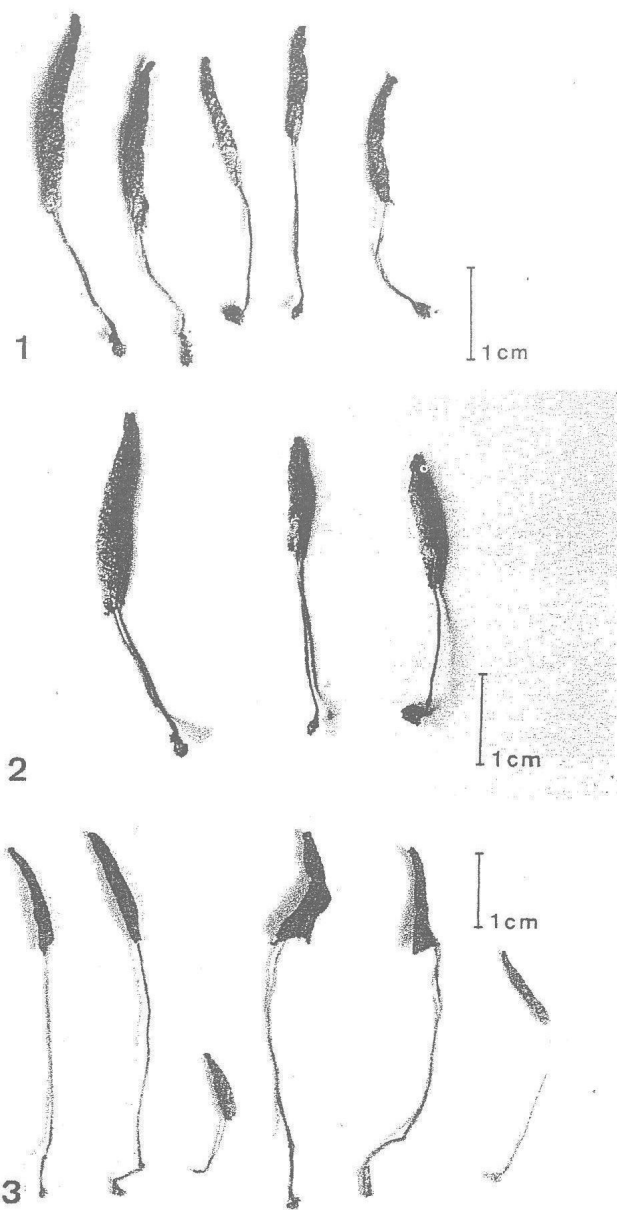


Fig. 1-3 — *Gastrocybe iberica* Moreno, Illana & Heykoop, carpophores [1-2, Holotypus n° 9 990 ; 3, n° 9 992].

At the present time the taxonomic position of this genus is controversial. For HAWKSWORTH & al. (1983) the genus *Gastrocybe* and *Galeropsis* belong to the family Galeropsidaceae, order Podaxales of the Gasteromycetes and they would be related to the family Bolbitiaceae of the Agaricales. SINGER & PONCE DE LEÓN (1982) placed it with the genus *Galeropsis* in the family Galeropsidaceae and pointed out that they represent secotiaceous fungi. Later on, SINGER (1986) still denotes that both genera belong to the family Galeropsidaceae and that they can be considered as Gasteromycetes in the traditional sense. WATLING & GREGORY (1981) distinguished agaricoid forms and gasteroid forms in the Bolbitiaceae and considered both genera, *Galeropsis* and *Gastrocybe*, among the gasteroid forms. WATLING & YOUNG (1983) included *Gastrocybe* in the Bolbitiaceae and not in the Galeropsidaceae. MOSER (1983) included the genus *Galeropsis* in the family Bolbitiaceae and no reference was made to *Gastrocybe*, possibly because it was unknown in Europe at that time. The first record of this genus in our continent (Spain and Italy) is made by WATLING & al. (1986).

We agree with these last authors and believe that the genus *Gastrocybe*, together with *Galeropsis*, belong to the family Bolbitiaceae, an argument based on the fact that the new described taxon has dermatocystidia, which brings it near to some species of the genus *Conocybe*, furthermore, it presents closed carpophores which makes it close to *Galeropsis*.

Hypothetically, we think that it is possible that the genus *Galeropsis* had its origin through the genus *Gastrocybe*. The reason for this hypothesis is that some species of *Gastrocybe* are macroscopically exact to those of *Galeropsis*, and a microscopic study of their pellis is necessary to differentiate them. Besides, in the case of *Gastrocybe iberica* the hymeniform cuticle is reduced to one single layer of cells, sometimes difficult to observe under the microscope, and through the loss of this layer the genus *Galeropsis* could have been originated.

The microphotographs were made under a Nikon microscope model Optiphot with an incorporated system of automatic photography and "Normaski" interference contrast.

The material examined has been kept in the herbarium of the Departement of Plant Biology (Botany) of the University of Alcalá de Henares and the numeration is indicated for any consultation or revision.

Gastrocybe iberica Moreno, Illana & Heykoop, sp. nov., Fig. 1-16

Etymology : from latin *iberica*, relating to the place where this fungus was collected.

Pileus (0,6), 0,8 - 2,2 (2,5) cm longus, 0,2 - 0,4 cm latus, cylindricus, acuto apice, coloris paleae simili, at cinereo in herbario, sine striis, glaber, cuius inferior pars clausam atque pedi adhaerentem se praebet.

Stipes, qui fit in basi paulo amplior (1) 2 - 4 (5,5) cm longus, fere 0,1 cm est latus. *Laminae* sunt ascendentes, pressae, proba forma, haud anastomosantes, interdum bifurcatae in basi, ochraceo-ferrugineo colore. *Lamellulae* non observantur. *Velum* abest.

Basidiosporae 15-20 (23) μ m longae, 9-13 (18) μ m sunt latae, quarum forma inter ellipsoidea et amygdaliformis, ochraceo colore, germinativo poro praeditae. *Basidia* bispórica sunt, 18-22 μ m longa, 9-11 μ m lata. *Cystidia* absunt. *Pileipellis* hymeniformis, cellulis quarum diameter est 9-17 μ m longus constituta. *Pileocystidia* frequentissima, hyalina, lageniformia, quorum est longitudo maxima 60 μ m, latitudo e 15 μ m vergit in 6 μ m rursusque in 8 μ m. *Fibulae* adsunt.

Habitat : in pratis hygrophytis [*Poaceae* sps., *Trifolium fragiferi*-*Cynodontetum*], basico in solo (pseudogley) populeti [*Populus alba*]. Item in pratis [*Hordeion leporini*], basico in solo (rendsinas). In praedio cui nomen « La Oruga », Compluti (Matriti) 30 TVK7282, leg. Moreno, C. Illana & M. Heykoop, 9-X-86, Holotypus n° 9 990.

Pileus (0.6) 0.8 - 2.2 (2.5) cm high and 0.2 - 0.4 cm broad, cylindrical, acute apex, cream-straw coloured, ash-coloured when dried, not striate and glabrous, touching the stipe being narrowed and applicate below. Stipe becoming slightly broader at the base (1) 2-4 (5.5) cm high and approximately 0.1 cm broad. Lamellae ascendant, narrow, well formed, not anastomosing but sometimes forked at the base, ochraceous-ferrugineous. Lamellulae not observed. Veil absent.

Basidiospores 15-20 (23) $\times$ 9-13 (18) μ m, variable in shape, ellipsoid-amygdaliform, ochraceous with germ pore not clearly visible under the optical microscope but very clear with « Nomarski » optics, and with hilar appendage. Basidia bispore, 18-22 $\times$ 9-11 μ m, sterigmata long, up to 7 μ m in length. Cystidia not observed. Pileipellis hymeniform, formed by clavate to pyriform or subglobose cells, 9-17 μ m in diameter. Pileocystidia very abundant, hyalines, lageniform at the base with a long cylindrical neck to subcapitate, up to 60 $\times$ 15 $\times$ 6 $\times$ 8 μ m. Clamp connections present.

Habitat : In hygrophytic meadow (*Poaceae* sp., *Trifolium fragiferi*-*Cynodontetum*), basic soil (pseudogley) from poplar grove [*Populus alba*]. And in meadows of *Hordeion leporini*, basic soil (rendsinas).

Material examined : Finca La Oruga, Alcalá de Henares (Madrid) 30TVK7282 leg. C. Moreno, C. Illana & M. Heykoop, 9-X-86, **Holotypus** n° 9 990 ; ibidem leg. C. Illana, 11-X-86, n° 9 991 ; climbing from the Finca La Oruga to the hill Ecce-Homo, Alcalá de Henares (Madrid), 30TVK7281, leg. C. Illana, E. Illana & J. Chico, 2-XI-86, n° 9 993 ; Los Catalanes, Alcalá de Henares (Madrid) 30TVK7081, leg. C. Illana, I. López & P. Sánchez, 2-XI-86, n° 9 992 ; Tabla Pintora, Alcalá de Henares (Madrid) 30TVK6979, leg. C. Illana & M. Heykoop, 9-XI-86, n° 9 994. Isotypus in the herbarium of Dr. R. Watling in Edimburg (E) and in the herbarium of the Royal Botanical Garden of Madrid (MA-fungi).

Comments : *Gastrocybe iberica* is characterized by its non-deliquestent cylindrical pileus with acute apex and with the lower part closed and applicate to the stipe. The gills are not anastomosed. It shows very abundant dermatocystidia in the cuticle ; it has no pleurocystidia ; the basidia are bispore and the spores have a clear germ pore well visible with « Nomarski » interference contrast. *Gastrocybe lateritia* Watling is different because of its quickly deliquescent carpophores with an open and cylindrical-campanulate to conical-campanulate pileus. Moreover, it presents lecythiform cheilocystidia and tetrasporic basidia. *Gastrocybe deceptiva* Baroni (= *Bolbitius tener* Berk. var. *incarnata* Peck), only known from North America (BARONI, 1981), is different from *G. iberica* because of the colour of its carpophores and the intervenose gills. Besides it lacks pileocystidia. The by BARONI (1981) observed and sketched cheilo- and pleurocystidia have not been observed in *G. iberica*. If we compare *G. deceptiva* with the new proposed species, they both have nearly identical macroscopic features, which is also a general character for all the species of the genus *Gastrocybe* ; they both have bispore basidia and the same measurements of the spores too, though the germ pore is not so clear in *G. iberica* as in *G. deceptiva* seen under the optical microscope.

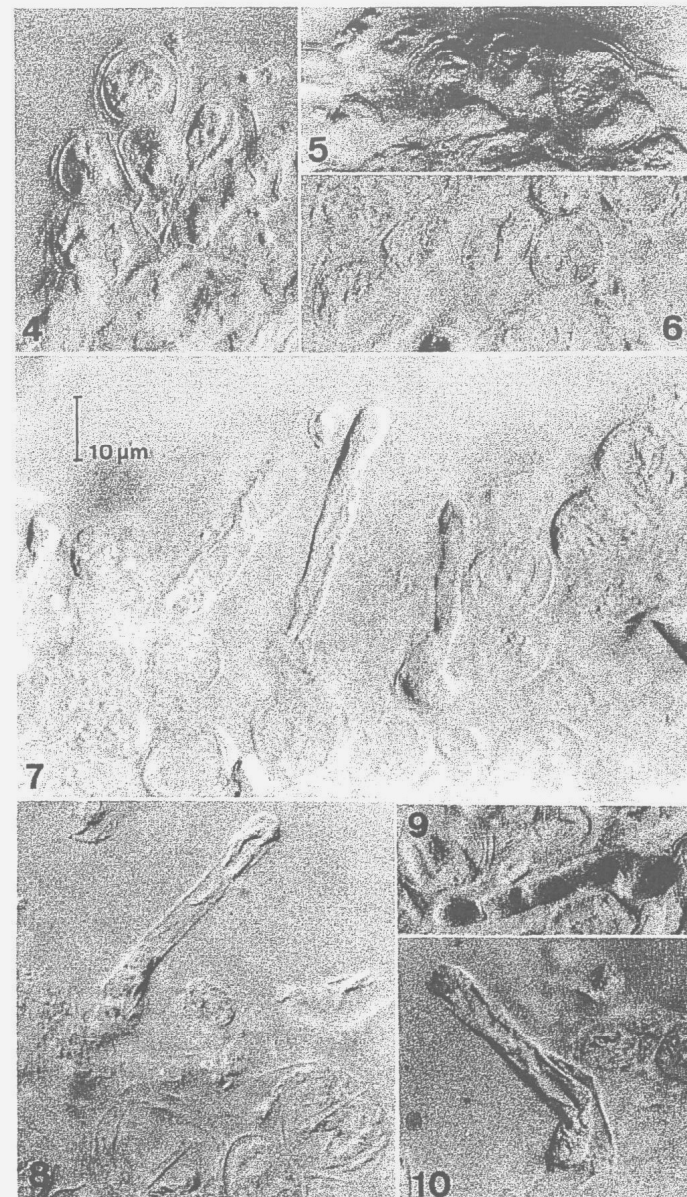


Fig. 4-10 — *Gastrocybe iberica* Moreno, Illana & Heykoop (Holotypus n° 9 990) ; 4-6 : hymeniform gelatinized cuticle, 7-10 : pileocystidia.

Fig. 4-10 — *Gastrocybe iberica* Moreno, Illana & Heykoop (Holotype n° 9 990) ; 4-6 : cuticule hyméniforme gélifiée. 7-10 : piléocystides.

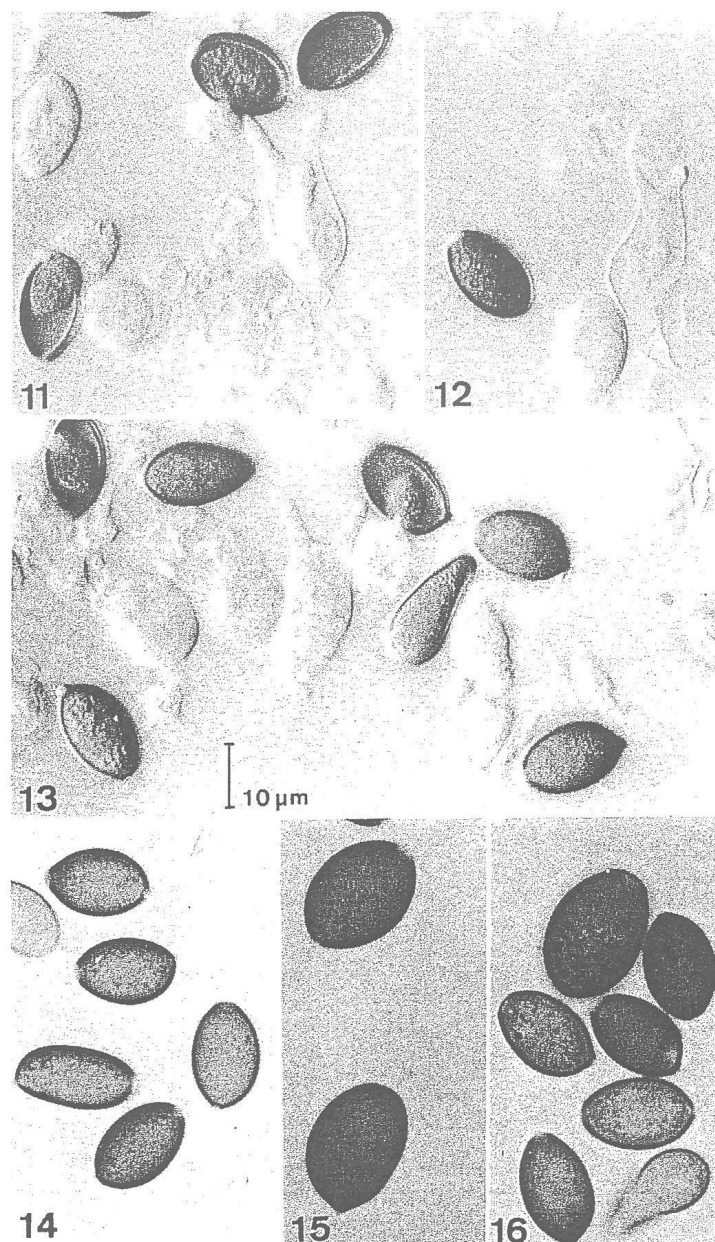


Fig. 11-16 — *Gastrocybe iberica* Moreno, Illana & Heykoop (Holotypus n° 9 990) ; 11-13 : bisporic basidia. 14-16 : basidiospores.

Fig. 11-16 — *Gastrocybe iberica* Moreno, Illana & Heykoop (Holotype n° 9 990) ; 11-13 : basides bisporiques. 14-16 : basidiospores.

The described species of the genus *Gastrocybe* Watl. can be differentiated in the following key.

- 1. Epicutis hymeniform *Gastrocybe* 2
- 1'. Epicutis a cutis *Galeropsis*; SINGER (1963), HEIM (1950, 1968) and SINGER & PONCE DE LEÓN (1982)
- 2. Carpophore soon deliquescent ; with lecythiform cheilocystidia ; basidia tetrasporic *Gastrocybe lateritia*
- 2'. Carpophore not deliquescent ; without lecythiform cheilocystidia ; basidia bisporic 3
- 3. Lamellae intervenose ; without pileocystidia *Gastrocybe deceptiva*
- 3'. Lamellae free, not intervenose ; abundant lageniform pileocystidia, subglobose at the base *Gastrocybe iberica*

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