Inocybe aurantiobrunnea and *I. pseudoorbata*, two new mediterranean species found in the Iberian Peninsula

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Abstract: *Inocybe aurantiobrunnea* and *I. pseudoorbata* are described as new species, growing in Mediterranean ecosystems of the Iberian Peninsula. A comparative study with the holotypes of the morphologically most similar species has been made. Colour photographs and line drawings of the new species are given. A taxonomic discussion including the most similar taxa is presented.

Resumen: *Inocybe aurantiobrunnea* e *I. pseudoorbata* son descritos como nuevas especies, fructificando en ecosistemas mediterráneos de la Península Ibérica. Se ha realizado un estudio comparativo con los holótipos de las especies más semejantes morfológicamente. Se aportan fotografías a color y planchas iconográficas de las nuevas especies. Finalmente, se discuten taxonómicamente aquellos táxones más próximos.

Zusammenfassung: *Inocybe aurantiobrunnea* und *I. pseudoorbata* werden als neue Arten beschrieben, die in mediterranen Ökosystemen der Iberischen Halbinsel wachsen. Eine vergleichende Studie der Holotypen morphologisch ähnlicher Arten wurde durchgeführt. Farbige Abbildungen und Zeichnungen der neuen Arten werden gebracht. Die ähnlichsten Arten werden taxonomisch diskutiert.

The present results are part of a monographic study on the genus *Inocybe* (FR.) FR. that one of the authors (F. ESTEVE-RAVENTÓS) is carrying out at present in the Iberian Peninsula (Andorra, Portugal and Spain – excluding the Canary Islands, which are considered to be within a different biogeographic area, e.g., Maccaronesia). Parts of these studies have been the compilation of bibliographical and chorological data (ESTEVE-RAVENTÓS 1999) and the description of some new taxa during the last years (ESTEVE-RAVENTÓS & al. 1997, 2002; VILLARREAL & al. 1998; ESTEVE-RAVENTÓS & TABARES 1999; ESTEVE-RAVENTÓS 2001; ESTEVE-RAVENTÓS & VILLARREAL 2001), most of them collected in genuine mediterranean ecosystems, which appeared to be very

diverse and rich in species. The studies of MALENÇON & BERTAULT (1970-1975) in Northern Africa were, through the years, of extraordinary value for taxonomists working in Mediterranean areas and are a fundamental bibliographic tool for *Inocybe* studies in Southern Europe.

Materials and methods

The material studied consists of two collections of *I. aurantiobrunnea* from Valladolid province (Castilla-León) and four collections of *I. pseudoorbata*, from Valladolid (Castilla-León) and Granada (Andalucía) provinces. These collections include representative and abundant specimens in all stages of development and have been deposited at AH (Herbarium of Alcalá University, Spain); duplicates of all collections exist at GDA (Herbarium of Granada University, Spain) and the private herbarium AVM of the Asociación Vallisoletana de Micología (Valladolid, Spain). Additional material studied for comparison was requested on loan from G (Conservatoire et Jardin Botaniques, Genève), L (Rijksherbarium, Leiden) and PC (Herbier Muséum National d'Histoire Naturelle, Paris), whereas a visit to MALENÇON's Herbarium at MPU (Herbier Université Montpellier II) enabled one of the authors (FER) to study some further *Inocybe* collections.

Microscopical slides of dried material were prepared with 5% NH_4OH and Congo red in 1% ammonia. Drawings were made with the aid of a camera lucida device. Spore measurements are quoted following HEINEMANN & RAMMELOO (1985). Colours of fruitbodies are referred basically to MUNSELL (1994) or, where indicated, to the Colour Identification Chart of the Flora of British Fungi (CIC-FBF) edited by the Royal Botanic Garden of Edinburgh in 1969. Authors abbreviations follow KIRK & ANSELL (1992). Terminology of cystidial elements has been adopted from KUYPER (1986).

As recent monographic references on this genus, we have mostly used those of BON (1997 a, b; 1998), KUYPER (1986) and STANGL (1989).

Results

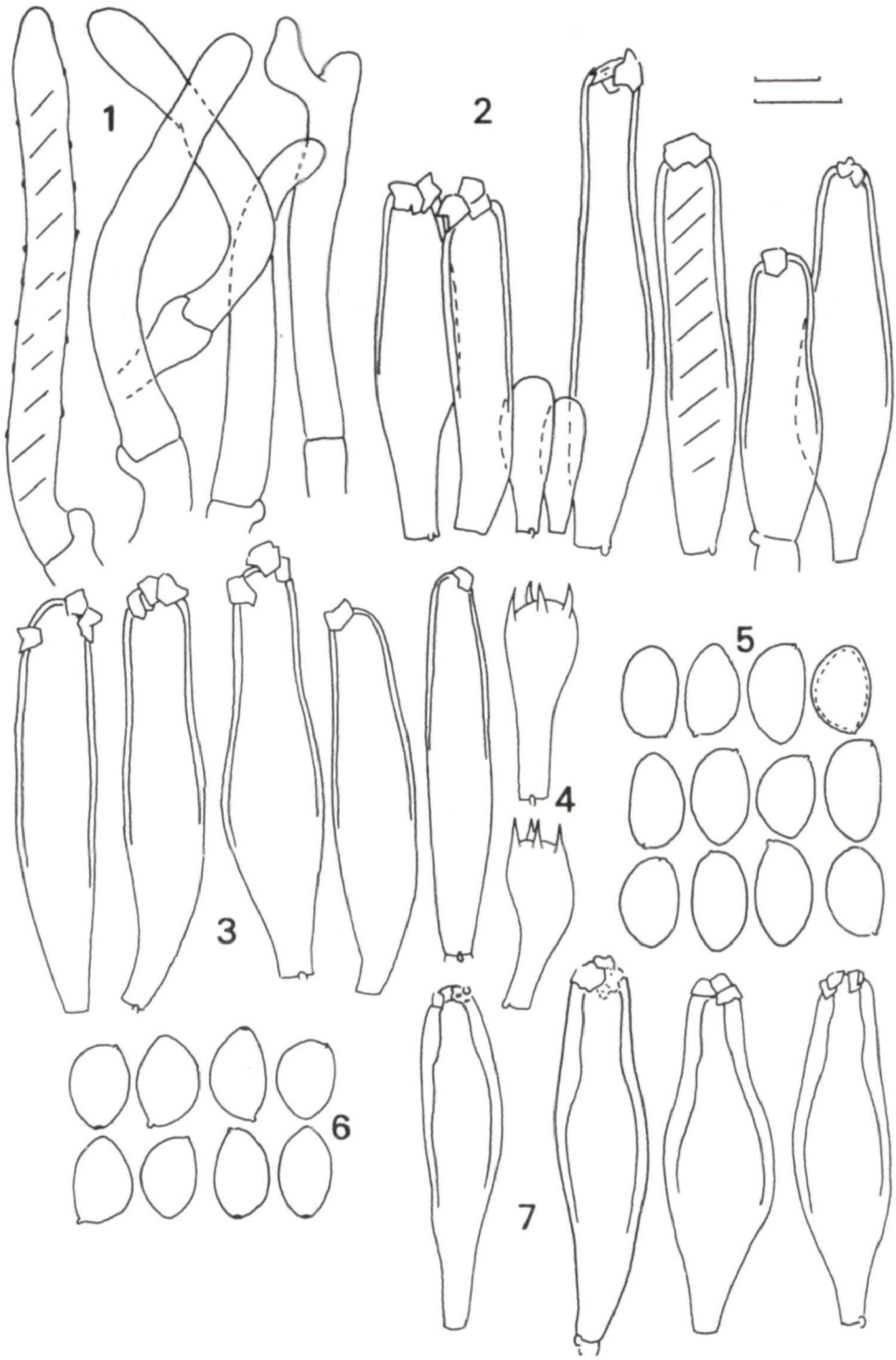
***Inocybe aurantiobrunnea* ESTEVE-RAV. & GARCIA BLANCO, spec. nova** (Colour fig. V, Figs. 1-5)

Descriptio latina:

Pileus 20-45 mm latus, conico-hemisphaericus, deinde conico-convexus vel convexo-applanatus, obtuso-umbonatus, margine primum involuto; cuticula glabra vel fibrillo-sericea, margine non rimoso, coloribus totus brunneus vel griseo-brunneus, velipelli alba obtectus. Lamellae distantes (L = 30-55), 4-6 mm latae, ventricosae, fortiter emarginatae, ab initio aurantiacae vel luteo-aurantiacae, deinde brunneo-aurantiacae, acie concolorae. Stipes 20-40 x 3-9 mm, aequalis vel vix clavatus, nec bulbosus, fibrillo-sericeus ad apicem, sub lamellis pruinoso-fibrillosus (-1/6), totus aurantiacus vel luteo-aurantiacus. Caro pilei et stipitis omnino luteo-aurantiaca. Cortina evanescentia. Odor nullus vel subspermaticus.

Sporae 9-11,8 x 6,2-7 µm, Qm = 1,57, laeves, ovoideae vel latae subamygdaliformes, apice subobtuso. Basidia 4-sporigera. Cheilocystidia 40-75 x 12-15(-20) µm, cylindrica vel subcylindrica, raro fusiformia vel subutriformia, leviter crassiparietalia (0,8-1,5 µm), paracystidia numerosa. Pleurocystidia similia. Caulocystidia solum sub lamellis, rariora, cito in pilos elongatos vergentia.

Humicola. In silva mixta, sub *Pinus halepensis* MILL. et *Quercus ilex* L. subsp. *ballota* (DESF.) SAMP.



Figs. 1-5. *Inocybe aurantiobrunnea*, Holotype, AH 30726. 1. Hairs at the stipe apex. 2. Cheilo- and paracystidia. 3. Pleurocystidia. 4. Basidia. 5. Spores. Figs. 6-7. *Inocybe luteipes*, Holotype. 6. Spores. 7. Cystidia. – Bar: 10 µm (large only for spores).

Etymology: from latin "aurantius" = orange, and "brunneus" = brown, owing to the presence of both contrasting colours in the basidiomata.

Holotypus: Hispania, Valladolid, Castromonte, AH 30726.

Characters:

Pileus: 20-45 mm in diam., at first conical to hemisphaerical, becoming conico-convex, finally plano-convex, obtusely umbonate, margin involute at first, slightly exceeding the lamellae, uniformly brown to grey-brown (MUNSELL 1994: 7.5YR 4/3-4/6; 5YR 4/2-4/4); surface smooth to slightly fibrillose, innately radially fibrillose, fibrils slightly diverging at margin, showing a paler background, not distinctly rimose neither rimulose; velipel-lis present, forming a whitish-greyish patch over the pileus centre, more or less persistent.

Lamellae: subdistant (L = 30-55), with lamellulae (l = 1-2), adnexed to deeply emarginate, rather ventricose, 4-6 mm broad, orange to orange yellow (golden), or croceus-yellow when young (CIC-FBF n° 48, 51), becoming orange-ochraceous with age, in exsiccata orange-brown to reddish-brown; edge finely fimbriate, concolorous.

Stipe: 20-40 x 3-9 mm, cylindrical or enlarging downwards, not bulbous, solid, concolorous with lamellae all over its length, pale yellowish only at extreme base; surface fibrillose-tomentose at the extreme apex (down to ¼ of the stipe length), sparsely fibrillose to nearly smooth downwards. Cortina very fugacious, hardly observable in adult specimens.

Context: firm, completely orange to orange-yellow or croceus over the whole fruitbody, but somewhat paler in the pileus, in exsiccata orange-brown to reddish-brown; odour practically absent, taste sweetish.

Spores: 9-11.8 x 6.2-7 µm, L x l = 8.92-10.56-12.2 x 6.17-6.7-7.22 µm, Qm = 1.35-1.57-1.79 (n = 30), smooth, ovoid to broadly amygdaliform with obtuse apex, without suprahilar depression, with slightly thick walls (-0.6 µm), occasionally provided with a "pseudocallus", apicula small.

Basidia: 25-30 x 9-11.5 µm, clavate, 4-spored, with sterigmata up to 4 µm long, pluriguttulate.

Lamellar edge: heterogeneous, mostly formed by cheilocystidia and paracystidia, with some intermixed basidia.

Cheilocystidia: 40-75 x 12-15(-20) µm, numerous, mostly cylindrical to subcylindrical, also fusiform to subutriform, crystalliferous, with thick walls (0.8-1.5 µm), yellow to pale yellow in ammonia, but not too bright, sometimes filled with yellowish pigment; paracystidia numerous, clavate.

Pleurocystidia: 50-70 x 11-15(-17) µm, similar in shape to cheilocystidia, with slightly thick walls (0.8-1.5 µm), yellowish in ammonia. Lamellar trama subregular, made up of 3-20 µm wide hyphae, often constricted at the septa, and with yellowish intracellular pigment.

Caulocystidia: absent or only present at the extreme apex, descending to 1/10 or 1/6, mixed with numerous cylindrical to clavate caulocystidioid hairs, thin walled and filled with yellowish pigment.

Pileipellis: a cutis of parallel hyphae; suprapellis of 5-12 µm wide hyphae showing strong brown to brown-yellow encrusting and parietal pigment; subpellis

hardly differentiated, constituted by broader hyphae, up to 18-25 µm wide, with intracellular yellowish pigment. Clamp connections present.

Habitat and phenology: in humus of sandy, calcareous soils in thermophilous mixed forests with pines (*Pinus halepensis*) and evergreen oaks [*Quercus ilex* subsp. *ballota* = *Quercus rotundifolia* LAM.]; both collections studied were gathered in spring time.

Material studied: Spain: Valladolid, Castromonte, La Espina, in sandy, calcareous soil of a mixed forest of *Pinus halepensis* and *Quercus ilex* subsp. *ballota*, 10. 5. 1998, leg. A. GARCIA BLANCO, M. SANZ CARAZO & J. B. DEL VAL, AH 29965, duplo in AVM. - - 30. 4. 2003, AH 30726 (Holotypus), duplo in AVM 1626.

Additional material studied: ***Inocybe luteipes*** **J. FAVRE: Switzerland:** Parc Natural Grissons, Graubünden, Fuorn, Val dal Botsch, among *Dryas octopetala* L. on calcareous soils, 2400 m s. m., 20. 8. 1950, leg. J. FAVRE, G(K) 13142 (Herb. J. FAVRE n° 101a- Lectotypus). ***Inocybe rufolutea*** **J. FAVRE: Switzerland:** Parc Natural Grissons, Fuorn, Val Nüglia, among *Dryas octopetala* L. on calcareous soils, alt. 2450 m s. m., 15. 8. 1950, leg. J. FAVRE, G(K) 13162 (Herb. J. FAVRE n° 113 – Holotypus). ***Inocybe rufuloides*** **BON: France:** Somme, Cayeux-sur-Mer, bois de Brighton, under *Pinus* in sandy, grassy soils, 19. 5. 1983, leg. M. BON, VAST and CLAUS, Herb. M. BON n° 83038 – Holotypus. ***Inocybe subporospora*** **KUYPER: The Netherlands:** Wassenaar, under *Pinus sylvestris* L. in sand dune, 2. 9. 1982, leg. T. W. KUYPER, L 2142 – Holotypus.

Observations: The striking combination of the brown pileus and the orange-yellow lamellae, stipe and whole context is very diagnostic for this new species; microscopically, it is characterized by the absence or presence of caulocystidia only at the extreme apex of the stipe (-1/6), rather broad spores (x 6.2-7 µm) and the subcylindrical, rather slender cystidia with hardly thick walls (0.8-1.5 µm), pale yellow in ammonia.

From a morphological and cromatical point of view, *I. aurantiobrunnea* is close to two species described by FAVRE (1955) from the Swiss alpine zone, growing in calcareous soils among *Dryas octopetala*: *I. luteipes* and *I. rufolutea*. They both show brown pilei, and yellow colours either on the stipe (*I. luteipes*) or the lamellae (*I. rufolutea*) and, in a similar way, the caulocystidia are reduced to a very narrow area at the stipe apex; they differ from *I. aurantiobrunnea* in habitat and context colours, being only yellow at the cortical layers of the stipe in the alpine taxa; also their cystidia are different (Fig. 7), broadly fusiform to utriform, and also shorter and with thicker walls (2-3.5 µm). It would seem that *I. luteipes* is also characterized by the spores with rounded apex and the presence of a germ-pore (Fig. 6); this character has been considered by KUYPER (1986) as diagnostic in *I. luteipes* and *I. subporospora*. We must say, however, that the taxonomical relevance of this character should not be overestimated; in many collections studied from the Iberian Peninsula of *I. tarda* KÜHNER and *I. subporospora* (= *I. tarda* var. *sabulosa* BON in the sense of KUYPER 1986), we have not been able to clearly separate both taxa on the basis of this character, and it has raised in us many doubts about its taxonomical importance.

Other yellow-tinged species are present in Europe, but these show caulocystidia descending –1/3 of the stipe: *I. lutescens* VELEN., *I. crocifolia* HERINK and *I. aurantiifolia* BELLER. The first is very similar to *I. nitidiuscula* (BRITZELM.) SACC. in its microscopical and ecological characters, whereas the last two belong to the *I. flocculosa* (BERK.) SACC. complex, thus having (sub)lageniform cystidia and much narrower spores than those of *I. aurantiobrunnea*; they also differ in the different colour of the context.

In spite of the complete absence of yellow colours, *I. rufuloides* BON and *I. psammobrunnea* BON are two brownish taxa which also grow in sandy soils and which share some similarities with *I. aurantiobrunnea*. Both taxa have been probably considered within KONRAD & MAUBLANC's (1927) or HEIM's (1931) broad concept of *I. brunnea* QUÉL. *Inocybe rufuloides* is very common in sandy, calcareous soils under *Pinus* in the Iberian Peninsula, and microscopically differs from *I. aurantiobrunnea* in the lageniform cystidia with thicker walls (1.5-3 µm) and abundant, often catenulate paracystidia at the lamellar edge (BON 1984); *I. psammobrunnea* was described by BON (1990) on the basis of one collection where the specimens showed a bluish context at the stipe apex; this character is exceptional for *Inocybe*, but was also described by MOSER (1978) for *I. brunnea*. The group belonging to the *I. tarda* complex (incl. *I. rufula* MALENÇON ex ALESSIO, *I. subporospora*, *I. rufuloides* and *I. psammobrunnea*) is in need of a deep revision to re-evaluate some morphological characters considered of taxonomical relevance up to now; also future molecular analysis could shed some light on this difficult group.

***Inocybe pseudoorbata* ESTEVE-RAV. & GARCIA BLANCO, spec. nova** (Colour fig. VI, Figs. 8-11)

Descriptio latina:

Pileus 35-80 mm latus, hemisphaerico-convexus vel plano-convexus, ab initio totus albus, deinde albo-argillaceus, laevis, margine non rimoso, velipelli alba obtectus. Lamellae confertae (L = 60-90), 3-6 mm latae, subventricosae, emarginatae, ab initio pallide rosae, deinde argillaceae vel luteo-argillaceae. Stipes 30-65 x 12-25 mm, aequalis, fortuito subbulbosus, pileo concolor, apice subfloccoso-fibrillosus, deorsum albo fibrilloso-subsquamulosus. Cortina evanescentia. Odor nullus vel subspermaticus.

Sporae 12-19 x 6,2-8,5 µm, Qm = 2,06, laeves, oblongae vel subcylindricae, lateralibus phaseoliformes. Basidia 4-sporigera. Cheilocystidia (30-)40-65(-85) x 10-20(-23) µm, claviformia, raro subcylindrica, tenuiparietalia, non incrustata. Pleurocystidia nulla. Caulocystidia nulla. Pruina stipitis e pilis fasciculatis.

Humicola. Sub pino maritimo (*Pinus pinea* L.) ad terram sabulosam.

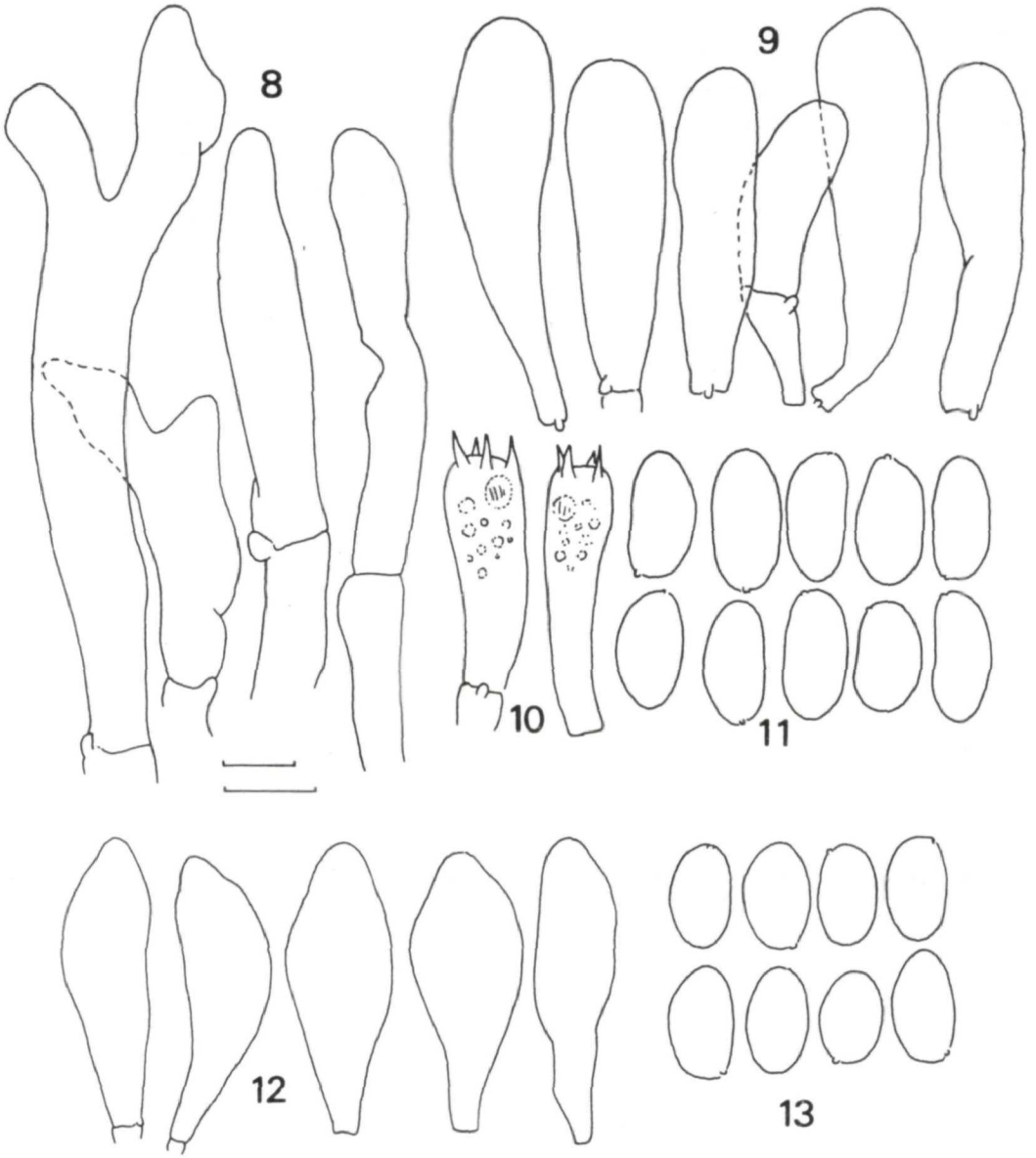
Etymology: on account of its apparent similarity to *Inocybe orbata*.

Holotypus: Hispania, Valladolid, Aldeamayor de San Martin, AH 30727.

Characters:

Habit: tricholomatoid, sometimes rather stocky.

Pileus: 35-80 mm in diam., at first hemisphaerical to convex, becoming plano-convex to applanate, without umbo, margin involute for a long time, finally straight upon pileus expansion, pure white in young primordia, with age turning to white-argillaceous or ivory-white, sometimes showing a yellowish–argillaceous or pinkish-argillaceous reflection (5Y 8/1; 2.5Y 8/1, 8/2; 10YR 8/1, 8/2); surface smooth, finely fibrillose radially but not distinctly rimose; velipellis usually present as a white patch over the pileus centre, fugacious or not.



Figs. 8-11. *Inocybe pseudoorbata*, Holotype, AH 30727. 8. Hairs at the stipe apex. 9. Cheilocystidia. 10. Basidia. 11. Spores. Figs. 12, 13. *Inocybe orbata*, Holotype. 12. Cheilocystidia. 13. Spores. – Bar: 10 µm (large only for spores).

Lamellae: very abundant and close (L = 60-90), with numerous lamellulae (l = 1-3), sometimes furcate at pileus margin, adnexed, sinuate to subventricose, rather narrow (3-6 mm broad), at first pink to pale pink in young specimens (5YR 8/3, 8/4), later becoming argillaceous and finally yellowish-argillaceous (10YR 8/3, 8/4); edge finely fimbriate, whitish to concolorous.

Stipe: 30-65 x 12-25 mm, rather stocky, cylindrical or slightly tapering upwards, solid, occasionally subbulbous, white to ivory-white, concolorous to pileus; surface finely fibrillose at first, in adult specimens typically floccose-fibrillose at apex, in some collections with distinct, whitish uplifted scales towards the base; rests of partial veil very fugacious, sometimes observable as a whitish fibrillose line on the stipe.

Context: firm, solid, white to argillaceous, sometimes white-yellowish on the pileus, pinkish-argillaceous on the stipe apex of fresh specimens; odour absent to very faintly spermatic, taste mushroom-like, sweetish.

Spores: 12-19 x 6.2-8.5 µm, L x l = 11.2-14.67-18.2(-19) x 6.1-7.1-8.15(-8.5) µm, Qm = 1.62-2.06-2.5 (n = 30), smooth, subcylindrical to oblong in face view, reniform in lateral view, with slightly thick walls (-0.6 µm), in some collections showing a "pseudocallus", apicula indistinct.

Basidia: 30-45 x 9.5-12(-15) µm, clavate, 4-spored, sterigmata up to 7 µm long, pluriguttulate.

Cheilocystidia: very abundant, forming a sterile band, (30-)40-65(-80) x 10-20(-23) µm, mostly clavate to broadly clavate, less often subcylindrical, thin-walled, not crystalliferous, in some collections filled with intracellular yellowish pigment.

Pleurocystidia: absent.

Hymenophoral trama: subregular, consisting of 3.5-15 µm broad hyphae, developing with time a yellowish intracellular pigment, this very evident in some refractive hyphae present in the context.

Stipitipellis: with numerous bundles of terminal, caulocystidioid hairs, cylindrical to claviform, similar to cheilocystidia, very often showing an irregular outline, sparsely lobed to obtusely furcate, usually filled with yellowish intracellular pigment.

Clamp connections: present.

Habitat and phenology: in humose, sandy, calcareous soils in thermophilous *Pinus* forests (*P. pinaster* AIT. and *P. pinea*); some populations show a semihypogeous growth, probably influenced by the nature of the soil, and then being rather stocky (stipe of the same length as pileus diameter), and strongly breaking the ground on development [hence reminding *Agaricus bitorquis* (QUÉL.) SACC.]. Up to now, *Inocybe pseudoorbata* is only known to fructify during spring time.

Material studied: Spain: Granada, Huétor-Santillán, Parque Natural de la Sierra de Huétor, Fuente de los Potros, under *Pinus pinaster*, 6. 6. 1997, leg. A. CAPILLA, AH 23384. Valladolid: Aldeamayor de San Martín, in sandy soil of a *Pinus pinea* forest, 10. 5. 1999, leg. A. GARCIA BLANCO, M. SANZ CARAZO & J. B. DEL VAL, AH 29968, duplo in AVM. - - 23. 4. 2003, AH 30727 (Holotypus), duplo in AVM 1610. Villanueva de Duero, same habitat, 1. 5. 2003, leg. A. GARCIA BLANCO, M. SANZ CARAZO & J. B. DEL VAL, AH 30728, duplo in AVM 1631.

Additional material studied: ***Inocybe orbata*** **MALENÇON: Mauretania:** Ifrane-Azrou, in pure or mixed forests of *Cedrus atlantica* (ENDL.) CARRIÈRE, 1625 m s. m., 1. 11. 1943, leg. G. MALENÇON, MPU (Herb. MALENÇON nº 1416 – Holotypus). ***Inocybe arenicola*** **(R. HEIM) BON: Spain:** Cantabria, Liencres, playa de Liencres, under *Pinus pinaster* in coastal dunes, 19. 10. 1993, leg. G. MORENO, AH 16511 (MORENO & al. 1994). Vizcaya, Gorliz, under *Pinus* spec. in coastal dunes, 23. 11. 1997, leg. C. E. HERMOSILLA, Herb. C. HERMOSILLA nº 2865. ***Inocybe arenicola*** **var. *mediter-***

ranea KUYPER: **Italy:** Ravenna, Lido di Classe, under *Pinus pinaster* on dune sand, 29. 9. 1981, leg. T. W. KUYPER, L (Fungi of Italy n° 1870 – Holotypus). ***Inocybe obsoleta* ROMAGN.: France:** Oise, in a calcareous, broad-leaved forest, 30. 7. 1957, leg. H. ROMAGNESI, PC (Herb. ROMAGNESI n° 57.32 – Holotypus).

Observations: *Inocybe pseudoorbata* is another member of section *Rimosae* (FR.) SACC., characterized by the whitish or very pale colours; its macroscopical habit reminds of *I. orbata* very much (hence its name), especially by the convex, never umbonate pileus, and the rather stocky habit. In the field, young fructifications of *I. pseudoorbata* can apparently be mistaken with a white *Agaricus* species, not only by the colour of the pileus, but particularly by the pinkish lamellae; these tinges, exceptional for an *Inocybe* species, are nevertheless fugacious, and can only be observed in young basidiomata, as this pigment seems to evolve to yellowish with age.

Microscopically, the new species is characterized by the long, cylindrical to oblong spores, typically reniform in profile, with a Qm = 2 or around this value. Its cheilocystidia are mostly clavate to broadly clavate, exceptionally reaching 80 µm in length.

Inocybe orbata seems to differ in several features from *I. pseudoorbata* (Table 1); it was described on the basis of an abundant collection by MALENÇON (MALENÇON & BERTAULT (1970) from Mauretania, fructifying during autumn under cedars. MALENÇON & BERTAULT (1970) never mention the presence of pinkish tinges in the lamellae (in spite of the many basidiomata observed by them); other microscopical characters of the African species (observed in the holotype, Figs. 12-13) are the rather short cheilocystidia (35-55 x 12-19 µm) and the smaller (L x l = 10.2-11.4-12.6 x 6.4-7-7.77; Qm = 1.32-1.6-1.89; n = 30), broadly ellipsoid spores, which are never reniform in lateral view.

Table 1. Comparative diagnostic features between holotypes of *Inocybe pseudoorbata* and *I. orbata*.

	Inocybe pseudoorbata	*Inocybe orbata*
Colour of lamellae	Pink to pale pink when young	White to argillaceous when young
Spore shape	Cylindrical to long ellipsoid, phaseoliform in profile	Broadly ellipsoid, not phaseoliform in profile
Spore size (L x l)	11.2-14.67-18.2(-19) x 6.1-7.1-8.14 (-8.5) µm	10.2-11.4-12.6(-13) x 6.4-7-7.77 µm
Spore Qm	1.62-2.06-2.5	1.32-1.6-1.89
Cheilocystidia	Clavate to broadly clavate, rarely subcylindrical, (30-)45-60(-80) x 10-20 (-23) µm	Clavate to utriform, 35-55 x 12-19 µm
Habitat	In thermophilous *Pinus* forests (*P. pinaster*, *P. pinea*), spring	Under Cedars (*Cedrus atlantica*), autumn

Inocybe arenicola is another pale species, growing in similar habitats; in fact, it shares with *I. pseudoorbata* the same long, subreniform spores, but differs in habit (pileus conical-campanulate when young and much longer stipe than pileus diameter), not pinkish lamellae and rather slender subcylindrical cheilocystidia. The holotype of *I. arenicola* var. *mediterranea* was also compared with the new species; according to KUYPER (1986), it shows no pinkish tinges in young lamellae, and the study of the type has revealed slightly shorter spores (L x l = 9.9-12.1-14.37 x 6-6.7-7.42; Qm = 1.43-1.81-2.2; n = 30), and a different habit, with a yellowish-buff, campanulate pileus. In

our opinion, this taxon should not be subordinated to *I. arenicola*, which shows very different cheilocystidia and a paler pileus, but to *I. fastigiata* var. *lobata* R. HEIM, with which it could be contaxic.

Inocybe obsoleta is very different, either macro- and microscopically from *I. pseudoorbata*; however it looks rather close to *I. rimosa* (variant "fastigiata" in the sense of KUYPER 1986); it differs from this by the very pale yellowish to buff-argillaceous pileus, a well developed white velipellis and lamellae without yellowish tinges. In our opinion, *I. fastigiata* f. *subcandida* MALENÇON (MALENÇON & BERTAULT 1970: 361) refers to this same taxon.

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V

VI

Colour Fig. V. *Inocybe aurantiobrunnea*, paratype (AH 29965). Colour Fig. VI. *Inocybe pseudoorbata*, paratype (AH 29968).