

- = 1.1-1.2, subglobose, at times broadly ellipsoid, rarely with some broad warts «*asterosporic form*». A species growing in grassland among mosses and short grass, but also in wood litter *C. greletii*
- 19) Basidia lacking a large basal clamp 20
- 20) Basidiomes up to 70 mm tall, gregarious, in dense tufts, dark brown, cinnamon brown, then blackish-brown in age; spores (6.3) 6.6-8.1 (8.2)  $\times$  (3.2) 3.3-3.8 (3.9)  $\mu\text{m}$ ,  $Q_m = 2.0$  (KAUTMANOVÁ ET AL., 2012b). A species growing in mown meadows. A species not yet found in Italy, in Europe reported only from Norway (gbif.org, 2020) *C. cf. fuscoferruginea*
- 20) Basidiomes small, with smaller-sized spores having a different Q 21
- 21) Basidiomes solitary to gregarious, or even in small tufts of few basidiomes, brown, fulvous, then blackish-brown in age; spores 5.1-6.2  $\times$  2.9-3.5  $\mu\text{m}$ ,  $Q_m = 1.8$ . A species growing in grassland among mosses and short grass *C. atroumbrina*
- 21) Basidiomes solitary or in small groups of two-three basidiomes, dark brown, red-brown, brown-yellowish; spores (5.0) 5.1-6.0 (6.5)  $\times$  (2.8) 2.9-3.4 (3.5)  $\mu\text{m}$ ,  $Q_m = 1.6$  (KAUTMANOVÁ ET AL., 2012b). A species growing in calciphile grassland with *Juniperus communis*. A species not yet found in Italy, in Europe reported from France (KAUTMANOVÁ ET AL., 2012b), the Netherlands (JÜLICH, 1984), Norway, Spain and Sweden (gbif.org, 2020) *C. pullei*

### **Clavaria with pink, orange, salmon, red or violet colours**

- 22) Basidia lacking a basal clamp 23
- 22) Basidia with a large basal clamp 28
- 23) Basidiomes up to 80 mm tall, coralloid and branched, lilac-pink, lilac, violet, occasionally bluish-violet, tending to fade to light violet-grey, light yellowish-grey in dry weather; spores 4.0-6.5  $\times$  3.5-5.5  $\mu\text{m}$ ,  $Q_m = 1.1$ . In natural grassland or in wood litter *C. zollingeri*
- 23) Basidiomes with large spores 24
- 24) Basidiomes up to 120 mm tall, gregarious, caespitose and fascicled at base, occasionally the apex is digitate or split into two-three short, flexuous branchlets, light pinkish-cream, pinkish-argillaceous, incarnate, light lilac-grey, light lilac, tending to fade to dull greyish-ochre tones few hours after gathering; spores 5.9-9.1  $\times$  3.5-4.7  $\mu\text{m}$ ,  $Q_m = 1.8$ . Southern Italy, in grassland *C. calabrica*
- 24) Basidiomes different in aspect, size, colour and spore size 25
- 25) Basidiomes bright pink, bright cyclamen pink, light reddish-pink, spores up to 8  $\mu\text{m}$  long 26
- 25) Basidiomes yellow to orange, spores shorter than 8  $\mu\text{m}$  27
- 26) Basidiomes solitary, gregarious or in small groups fascicled at base, of a distinct bright pink, bright cyclamen pink or light reddish-pink colour, fading with maturation and in dry weather, with a tendency to yellowing for the apical portion; spores 5.3-7.9  $\times$  2.5-3.4  $\mu\text{m}$ ,  $Q_m = 2.2$ . Alpine pastureland *C. rosea*
- 26) Basidiomes as above, but spores 6.0-7.5 (9.0)  $\times$  5.5-7.0 (8.0)  $\mu\text{m}$ ,  $Q_m = 1.1$  (FURTADO & NEVES, 2016). A species not yet found in Italy, in Europe reported

from France (?), Germany, Great Britain (CORNER, 1950), Austria and Sweden (gbif.org, 2020)

***C. subglobosa***

- 27) Basidiomes often fascicled at base, but only in small tufts, yellow with orange tinges, light orange, tending to fade in dry weather; spores (5.5) 6.1-7.4 × (2.8) 3.1-3.8 (4.2) μm,  $Q_m = 2.0$ . Natural grassland and grassy areas in parks and olive tree groves (See also the yellow-coloured species, n. 9a)

***C. amoenoides***

- 27) Basidiomes solitary to gregarious, caespitose or fascicled at base, bright orange, at times with thin yellow striae and pale pinkish zones, in age tending to fade to orange-yellow starting from the tips; spores 4.5-7.2 × 3.2-4.6 μm,  $Q_m = 1.6$ . On bare calcareous soil or among moss carpets, under *Pyrus amygdaliformis* and various *Cistus* sp.

***C. salentina***

- 28) Spores ornamented 29

- 28) Spores always smooth 30

- 29) Basidiomes solitary or gregarious, orangish-yellow with pink tinges especially over the lower third of the club, yellowish-pink, light orangish-pink, tending to fade in dry weather; spores 6.1-8.4 × 4.1-5.5 μm, their outline smooth or with one or more tubular appendices up to 1.0 (1.2) μm long. In Mediterranean scrub, in leaf litter of *Arbutus unedo*, *Fraxinus ornus* and *Erica arborea*

***C. appendiculata***

- 29) Basidiomes solitary or subfascicled to subgregarious, dark pink, salmon pink; spores 6.6-9.3 (10.0) × (4.8) 5.3-7.4 μm, ornamented with cylindrical spines up to 2.5 (3.0) μm long. In grassy or mossy areas of natural or semi-natural grassland, on soil probably calcareous. A species not yet found in Italy, in Europe reported from Belgium and the Netherlands (GEESINK & BAS, 1992)

***C. stellifera***

- 30) Basidiomes solitary, pastel pink, fading in dry weather; spores (6.1) 6.4-7.8 (8.6) × (4.9) 5.1-6.9 (8.1) μm,  $Q_m = 1.1$  (KAUTMANOVÁ, 2014). A species not yet found in Italy, in Europe reported only from Slovakia (KAUTMANOVÁ, 2014)

***C. roseoviolacea***

- 30) Spores with a different sporal quotient 31

- 31) With leptocystidia not exceeding the hymenial palisade 32

- 31) Hymenial leptocystidia always absent 33

- 32) Basidiomes up to 115 mm tall, solitary or in tufts of two conrescent specimens, pink on gathering, then tending to fade to uniform pale pink or pinkish-ochraceous tones; spores 6.6-9.2 × 4.6-6.5 μm. On bare or mossy soil, near *Pistacia lentiscus* and *Quercus suber*

***C. messapica* f. *messapica***

- 32) Basidiomes up to 150 mm tall, white, light creamy-white, occasionally also with light pinkish tinges over the lower third, the rest of the club being creamy-white; spores 6.5-9.2 × 4.7-6.8 μm. Under heaps of *Pteridium aquilinum* in olive tree groves not sprayed with pesticides (See also the white-coloured species, n. 6b)

***C. messapica* f. *alborosea***

- 33) Average sporal quotient about 1.4 34

- 33) Average sporal quotient higher (1.5-1.6) 35



- 34) Basidiomes up to 5-20 (30) mm tall, generally gregarious or in small tufts of two-five specimens, light pink, apex almost white in young clubs, stipe yellowish; spores  $5.2-6.1 (6.4) \times 3.8-4.3 \mu\text{m}$  (KAUTMANOVÁ ET AL., 2019). On bare or mossy soil under shrubs, along the edge of old forestry service paths in deciduous woods. A species not yet found in Italy, in Europe reported from Norway, the Czech Republic and Slovakia (KAUTMANOVÁ ET AL., 2019)

***C. parvispora***

- 34) Basidiomes up to 160 mm tall, solitary or gregarious, at times in bunches of two basidiomes joined at the base, light incarnate, yellowish-pink, orangish-pink, with concolorous tips, spores  $5.9-8.8 \times 4.6-6.1 \mu\text{m}$ . On grassy, pesticide-free soil of an olive tree grove under thick stacks of *Pteridium aquilinum*

***C. tyrrhenica***

- 35) Spores at most  $8 \mu\text{m}$  long or a trifle longer **36**

- 35) Spores longer **37**

- 36) Basidiomes up to 60 mm tall, solitary or gregarious, light incarnate, salmon pink, pinkish-yellow, tending to fade in dry weather, hymenophore turning brown with 30% potassium hydroxide and only slightly so with ferrous sulphate. Spore  $6.2-8.4 \times 4.1-5.4 \mu\text{m}$ ,  $L_m = 7.1 \mu\text{m}$ ,  $l_m = 4.6 \mu\text{m}$ ,  $Q = 1.4-1.7$ ,  $Q_m = 1.5$ , generative hyphae up to  $14 \mu\text{m}$  wide. In woods, hardly visible in the vegetal litter, but also on bare ground and on the damp slopes of wood paths

***C. incarnata***

- 36) Basidiomes up to 40 mm tall, tips often forked-spathulate, solitary or gregarious, even in bunches of several basidiomes joined at the base, pale to bright pink, then tending to fade to pale pink starting from the tips and reddening towards the base (24-36 hours), hymenophore becoming slowly very pale brownish with 5% potassium hydroxide, unreactive with ferrous sulphate. Spores  $6.0-8.2 \times 4.3-5.6 \mu\text{m}$ ,  $L_m = 7.3 \mu\text{m}$ ,  $l_m = 4.9 \mu\text{m}$ ,  $Q = 1.3-1.7$ ,  $Q_m = 1.5$ , generative hyphae up to a  $15 (18) \mu\text{m}$  wide. On moss and in needle litter of

***Cupressus sempervirens***

***C. apulica***

- 37) Basidiomes up to 50 mm tall, solitary or gregarious, light incarnate, light greyish-pink, hymenophore turning pale brownish with ferrous sulphate. Spores  $6.5-10.5 \times 4.5-6.5 \mu\text{m}$ ,  $L_m = 8.4 \mu\text{m}$ ,  $l_m = 5.6 \mu\text{m}$ ,  $Q = 1.3-1.7$ ,  $Q_m = 1.5$ , basidia with or without a basal clamp, generative hyphae up to  $12 (15) \mu\text{m}$  wide. In Mediterranean scrub, mostly with *Quercus ilex*, *Cupressus sempervirens* and *Phillyrea latifolia*, on moss and vegetal litter on calcareous soil

***C. pisana***

- 37) Basidiomes up to 50 mm tall, solitary or gregarious, watery pink, light incarnate, bright pink, tending to fade in dry

weather, hymenophore unreactive with ferrous sulphate. Spores  $6.7-10.3 \times 4.4-6.3 \mu\text{m}$ ,  $L_m = 8.5 \mu\text{m}$ ,  $l_m = 5.4 \mu\text{m}$ ,  $Q = 1.4-1.7$ ,  $Q_m = 1.6$ , generative hyphae up to  $15 \mu\text{m}$  wide. In Mediterranean environment, on silty-sandy soil, on bare or mossy ground *C. pseudoincarnata*

**Notes:** *Clavaria candida* Weinm., described in 1836 as a white, simple, filiform species with a hardly differentiated, hairy stipe and growing gregariously on barks in winter, has received various and contrasting interpretation over time.

QUÉLET, 1880 ("1879")a, credits it with white, pruniform, echinulate spores up to  $10 \mu\text{m}$  long. CORNER (1950) recombines it in the Genus *Clavulinopsis*, as a species close to *Clavaria asterospora*, but differing in spore shape. According to PILÁT (1958) its spores are larger,  $10-13 \times 7.5-9.0 \mu\text{m}$ , and have spines up to  $3.5 \mu\text{m}$  long. ROMAGNESI (1969) still reports it under the old name of *Clavaria candida*, and soon after, CORNER (1970), reconsiders the concept of the species, abandoning the generic name *Clavulinopsis* in favour of the original *Clavaria*; however, at the same time he relegates it among the synonyms of *Clavaria asterospora*.

Finally, OERTEL & FUCHS (2001) assign to it smaller spores,  $6.8-7.4 \times 4.6-5.6 \mu\text{m}$  with an ornamentation  $0.8-1.6$  ( $2.0$ )  $\mu\text{m}$  high.

Given such discordant interpretations, Weinmann's taxon is here regarded as a *nomen confusum*.

\* Fungi in GBIF Secretariat (2019). GBIF Backbone Taxonomy. Checklist dataset <https://doi.org/10.15468/39omei> accessed via gbif.org on 2020-03-30

## *Clavaria amoenoides*

Corner, K.S. Thind & Anand

The British Mycological Society Transactions 39 (4): 483. 1956

**Holotypus:** PAN 45, India, Mussoorie, the Park, on soil in pine-oak forest, 11.09.1953

### Descrizione originale

*Receptacula ad  $12 \times 0.6 \text{ cm}$ , simplicia, solitaria, gregaria vel caespitosa, pallide aurantia, stipiti ad  $3.3 \times 0.4 \text{ cm}$ , pallidiori, inodora, insipida: sporis  $6-7 \times 3-4 \mu$ , ellipsoideis, agut-tatis: basidiis haud fibulatis, sterigmatibus 2-3-4: hyphis ad  $25 \mu$  latis, breviter septatis, aliis angustis distanter septatis intermixtis, haud fibulatis.*

**Etimologia:** l'epiteto specifico è riferito alla somiglianza a *Clavaria amoena* Zoll. & Moritzi.

### Descrizione

**Fruttificazioni** clavarioidi, fragili, alte fino a  $50 \text{ mm}$ , larghe fino a  $3-5 \text{ mm}$ , solitarie o gregarie, sovente fascicolate per la base ma solo a piccoli ciuffi, semplici, non ramificate.

**Gambo** cilindrico, esile, alto sino a  $10 \text{ mm}$ , largo circa  $1 \text{ mm}$ , dritto o incurvato, praticamente indistinguibile dalla clava fertile superiore, in basso con residui miceliari biancastri.

**Clava** da cilindrica a subclavata, incurvata o flessuosa, anche ritorta o ripiegata su sé stessa, con l'apice ottuso e arrotondato, raramente schiacciato e allargato. Superficie imenoforale liscia, ben presto longitudinalmente rugosa, di colore crema, crema-giallo, giallo chiaro