

Mitte hin, wie es für die Ascomyceten typisch sein soll², wurde nicht beobachtet. Den Zellwänden lag stets faltenlos eine bei starker Vergrößerung doppelt konturierte kontrastreiche Schicht von etwa 260 Å Dicke auf, die als endoplasmatisches Reticulum angesehen werden kann. Lomasomen, wie sie MOORE³ beschrieb, konnten bei Penicillien nicht eindeutig identifiziert werden. Aufgrund der sehr geringen Kontraste der Plasmagrenzschicht kann ihr Vorkommen auch nicht mit Sicherheit ausgeschlossen werden.

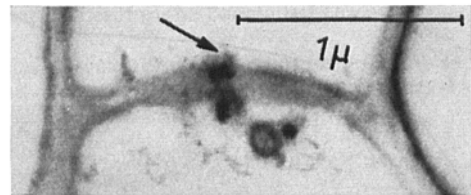
Das Auftreten elektronendichter Pfropfe in manchen Trennwänden zwischen Metulae und Phialiden könnte als Stadium der Passage eines Nukleus gedeutet werden.



Figuren 1 und 2. Aufeinanderfolgende Längsschnitte durch eine Phialide von *Penicillium brevis-compactum* 151 mit elektronendichtem «Pfropf» (Pfeil!) in der Trennwand zur Metula hin.

Für eine solche Annahme spricht, dass die «plugs» nicht vom endoplasmatischen Reticulum ummantelt werden und dass sie gerade an diesen Querwänden häufig zu sehen sind. Der hohe Bedarf auch an geformten Zellinhaltsstoffen ist beim konidienbildenden Organ bekannt; die Wahrscheinlichkeit, solche Stadien beim Schneiden zu treffen, ist daher gegenüber anderen Zellen stark erhöht. Für diese Hypothese spricht ferner, dass MOORE und McALEER³ ihre «plugs» gerade an ascogenen Hyphen fanden, wo ebenfalls ein starker Transport in apikaler Richtung stattfindet.

Septal-Poren mit Plasmodesmen, wie sie HASHIMOTO et al.⁴ und später BALLESTA und VILLANUEVA⁵ sowie KIRK und SINCLAIR⁶ bei *Geotrichum* beobachteten, wurden bei den untersuchten imperfekten Penicillien nicht gefunden.



Figur 3. Der auf Figur 2 folgende Schnitt median durch die Querwand mit «Pfropf» (Pfeil).

Summary. In the centre of the septum between phialide and metula of certain imperfect penicillia a plug was observed as electron dense mechanism. This observation is rather similar to that of MOORE^{2,3} in the case of 2 Ascomycetes. The author believes these plugs are nuclei migrating through septa. This is because they are not enclosed by the endoplasmatic reticula.

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Bundesforschungsanstalt für Lebensmittelrisikohaltung,
Karlsruhe (Deutschland), 2. Dezember 1966.

⁴ T. HASHIMOTO, T. KISHI und N. YOSHIDA, *Nature* 202, 1353 (1964).

⁵ J. P. G. BALLESTA und J. R. VILLANUEVA, *Experientia* 22, 471 (1966).

⁶ B. T. KIRK und J. B. SINCLAIR, *Science* 153, 1646 (1966).

Sex Reversal of *Cobitis taenia* L. (Osteichthyes, Fam. Cobitidae)

Abnormal sex ratios, which have been reported by various authors¹⁻³ for *Cobitis taenia* L., suggested to the author of the present note the possibility that such species may be a false gonochorist. According to such a working hypothesis, *Cobitis taenia* would be one of those species whose individuals show completely male or female gonads during long phases of their life cycles, and germinal cells of both sexes during short periods, after which the germinal elements of the first sex phase are completely replaced by the germinal cells of the second

sex phase⁴. Such view is also supported by observations on the so-called CANESTRINI's organ⁵ which by some authors² is regarded as a typical secondary male character and by some other authors^{3,6} is not regarded as

¹ F. DE FILIPPI, vide G. CANESTRINI, *Fauna d'Italia* 3, Pesci, 20 (1874).

² L. GAMBETTA, *Boll. Musei Zool. Anat. comp. R. Univ. Torino* 44, 297 (1934).

³ G. ZANANDREA and G. CAVICCHIOLI, *Boll. Zool.* 31, 1387 (1964).

⁴ G. BACCI, *Sex determination* (Pergamon Press, Oxford, 1965).

⁵ G. CANESTRINI, *Riv. scient-ind. princ. Scop.* 3, (1871).

⁶ V. FATIO, *Faune des Vertébrés de la Suisse* (Genève, 1890), vol. 5.

such, because they have found it in a more or less reduced state in female individuals. CANESTRINI's organ can be defined as a lenticular swelling with a diameter ranging between 4 and 5 mm which lies at the basis of the pectoral fin between the 2nd and last ray².

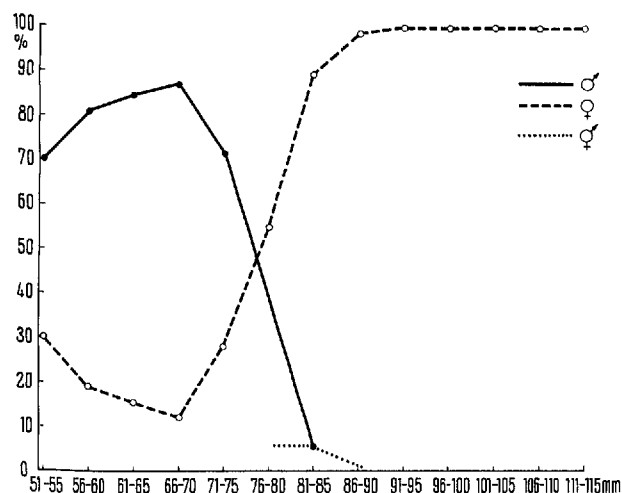


Fig. 1. % of morphologically male, female and hermaphrodite individuals of *Cobitis taenia* in different size classes.

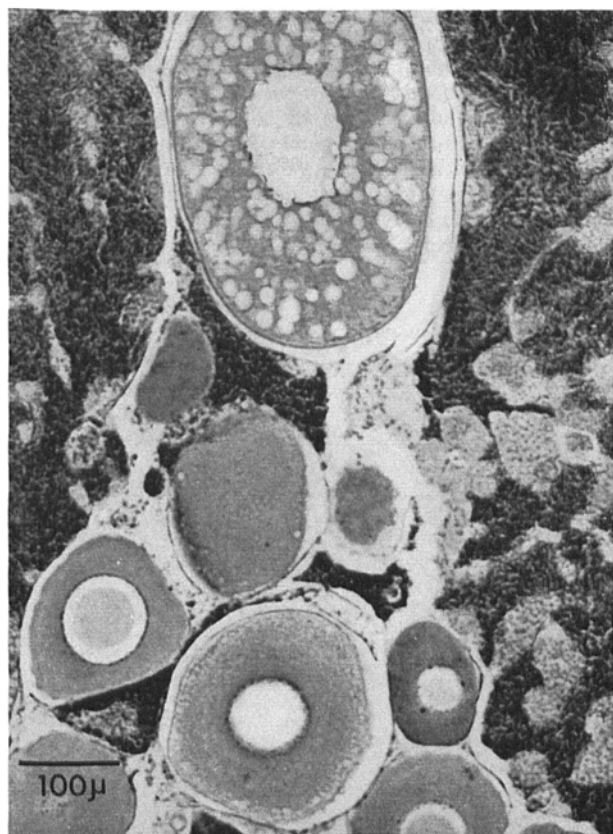


Fig. 2. Section of a gonad of *Cobitis taenia* showing big oocytes which are surrounded by male sexual cells at various stages of maturation.

659 individuals of *Cobitis taenia* have been collected in the Chisola torrent near Turin. Males were 258 with a mean length of 67.6 ± 0.7 mm and females were 393 with a mean length of 88.3 ± 1 mm. Sex ratio was thus 1:1.5. Sex proportions in the different size classes (Figure 1) show that a certain number of females are present in the lower and no males are present in the higher size classes, and that there is a sudden increase in % of females beginning with the 66-70 mm class. Classification into male and female individuals was made on purely morphological grounds upon inspection of both the external secondary sex characters and of the gonads. Statistical analysis and the discovery of individuals with morphologically hermaphrodite gonads showed nevertheless that most of them can be regarded as male phase and female phase individuals.

Histological examination showed in fact hermaphrodite gonads in individuals that were classified as males on the basis of the presence of a fully developed CANESTRINI's organ. Such individuals belonged to size classes above 80 mm, that is to sizes corresponding to the maximum rate of increase in the relative number of female phase individuals. Figure 2 shows one such gonad with big oocytes surrounded by male germinal elements at various stages of maturation. Hermaphrodite gonads ranging from almost exclusively male territories to almost exclusively female territories have been found.

For the above reasons, the *Cobitis taenia* examined must be regarded as belonging to an unbalanced hermaphrodite population⁴ which is characterized by a high sexual variability including successive hermaphrodites and pure female individuals. The existence of pure males is not demonstrated as yet. Alleged cases of accidental hermaphroditism in the *Cobitidae* family, which are reported in the literature⁷⁻⁹, can perhaps be interpreted as instances of individuals which were examined at the time of sex reversal from the male to the female phase. Also the presence of reduced CANESTRINI's organs which have been found in various female individuals by the above-cited authors^{8,9} can thus be interpreted as the trace of the male phase livery in individuals which have undergone sex reversal.

The existence of protandrous successive hermaphroditism with distinct maturation can thus be regarded as demonstrated in the family *Cobitidae*, although the existence of different patterns of sex variability may also be assumed for different populations¹⁰.

Riassunto. Una popolazione di *Cobitis taenia*, specie considerata sinora gonocorica, è risultata essere ermafrodita non bilanciata cioè con alta variabilità sessuale, comprendente ermafroditi successivi proterandrici e femmine. La presenza di maschi puri non è stata ancora dimostrata.

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Istituto di Zoologia, Università di Torino (Italy),
12th December 1966.

⁷ S. L. HORA, J. Asiat. Soc. Beng. 22, 77 (1927).

⁸ R. SUZUKI, Zool. Mag. Tokyo 64, 229 (1955).

⁹ H. KOBAYASHI, Annotnes zool. jap. 28, 17 (1955).

¹⁰ This work was supported by a financial grant from the Italian C.N.R.