„PRESLIA“ VĚSTN'K ČESKOSLOVENSKÉ BOTANICKÉ SPOLEČNOSTI V PRAZE. BULLETIN DE LA SOCIÉTÉ BOTANIQUE TCHÉCOSLOVAQUE À PRAGUE. VOL. VIII., 1929.

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Preliminary results of ontogenetic and phyllogenetic studies of the genus Omphalia.

Recent anatomical and ontogenetic studies in the *Agaricinae* have shown that some genera are not natural at all; that the sections are not well founded and that some of them belong to other genera. Many authors (BERKELEY, RICKEN, REA, VELENOVSKÝ a. o.) contented themselves mostly with outer features, so that the division given by FRIES was almost universally accepted. FRIES (in 1821, Systema myc. I.) placed *Omphalia* (with the genus *Mycena*) as tribus IX. and X. in the class of the *Leucospori* of the genus *Agaricus* LINNÉ (IV., Hymenini II., Pileati), in the division with central unveiled stem. In the genus *Mycena,* the group *Omphalariae* comprises species which really belong to *Omphalia*, and besides comprises also representatives of the genera *Marasmius* and *Clitocybe.* With but small modifications, the division of the genus *Omphalia* given by FRIES (with the exception of the third section), is accepted to this day, though it is not in keeping with the anatomical and ontogenetic features. The species of the aspect of *Mycenae* form the section of the *Mycenariae,* with submembranous cap and decurrent gills. In yougth the rim of the cap is smooth and pressed to the stem. The species of the aspect of *Collybia* form the section of the *Collybiariae*, with pulpous-membranous cap and adnate gills. In youth the rim is incurved. The third section (*Lentiscyphi*) does not belong to the *Omphaliae*, most of these species forming the genus *Lentinus.* Some species considered as *Omphaliae* belong to the genus *Clitocybe, Collybia* (*Ag. atratus, muscorum, fragrans, ericetorum*, etc).

According to FRIES the genus *Omphalia* gives the impression of uniformity, the species having the aspect either of *Collybia* or of *Mycena.* Morphologically, as shown by certain outer features, they would represent but a kind of transition. The division given by FRIES, is very convenient from a practical point of view, and has therefore been employed in all mycoflores. The genus *Omphalia* like the genus *Mycena,* sensu FRIES is not however a natural genus, as can be seen from the histological organization of the receptacle as well as from it's ontogeny. The subsection *Integrellae*, with rib-like gills, shows considerable morphological and anatomical differences, and therefore caused FAYOD and PATOUILLARD to separate it into a special genus, *Delicatula.* The group of species around *Omphalia gracillima* forms a transition to this genus. Similarly, in the genus *Mycena* sensu FRIES, the section *Basipedes* shows quite a number of features which would exclude it from the genus *Mycena.* The detailed studies by KÜHNER (Paris 1926) and KAVINA (Preslia VI, 1928) furnished many interesting remarks to the knowledge of the anomical structure of both genera. In the *Omphaliae*

special attention has to be paid to the epidermis of the cap which, from an anatomical point of view, distinguishes these species from the *Mycenae.* A kind of transition between these two genera is formed by the group *Adonideae* of the genus *Mycena.* The white species here look entirely like *Omphaliae*, and some of the network characteristic of *Mycena* are developed as in *Omphaliae* (epidermical layer of the cap). The surface layers are badly differentiated in an hypodermal part and epicutis. In the genus *Omphalia,* the hypodermic part is not differentiated at all. The genera *Omphalia* and *Delicatula* are generally characterized by a small differentiation of the network, striking in comparison with the genus *Mycena* and especially with the group *Basipedes.* We also do not find a mucous epidermis as it is developed in many species of *Mycenae.* The group *Integrellae,* which FAYOD separated as the genus *Delicatula,* has a very thin epidermis which disappears leaving the hyphae in the receptacle an irregular mass as compared with the relatively regular course of the hyphae in the receptacles of *Mycenae* and *Omphaliae.* In the hymenium we find quite a number of lesser deviations, but the essential feature is the slightly developed subhymenial layer. The external hyphae in the cap are entirely like the external hyphae at the base of the stem, and this is in favour of an angiocarpal receptacle, further indicated by the nature of the cells of the traces of a velum at the surface of the cap and also in other places (for instance by hairs at the base of the stem). There is, however, no true angiocarpium, as KÜHNER thougt, but a special case of hemangiocarpium because the part forming the hymenium is at least in earliest youth closed. Of course, at the time when the gills begin to develop and when the different parts of the hymenium begin to differentiate, we can already speak of a free hymenium. The velum does not form any ring and is restricted to tiny hairs at the surface of the stem. Traces of this velum appear howerer distinctly in the earliest youth.

In the group *Basipedes* of the genus *Mycena,* the stem is anatomically separated from the network of the cap. The hyphae of the stem continue parallely to the cap and end bluntly at its border. These ends of the cylindric hyphae intertwine with thin ramified hyphae, which form a kind of collar at the top of the cylinder of stem hyphae, and these connecting filaments, much intertwined and entagled, form the connection with the remaining network of the cap. KÜHNER was the first to draw attention to this fact, and bring some light into the study of this irregular section.

The *Omphaliae* may be compared not only with the genus *Mycena* with which a whole group shows similar morphological features, but also with the genera *Clitocybe*, *Collybia* and *Hygrophorus,* into which to-day many species are placed. *Hygrophorus* and *Clitocybe* have decurrent gills, but *Hygrophorus* has a more watery, wax-like receptacle while *Clitocybe* has a pulpy membranous one. On the other hand, *Collybia* has adnate, almost nondecurrent gills (and in this, appears more closely related to the genus *Mycena*), but the border of the cap is first incurved as in some *Omphaliae.* The genus *Lentinus*, distinctly different from the genus *Omphalia,* was attached to it by FRIES (Systema, 1821) only according to its apparent outer features. The correlation between the individual species and their relation to neighboring genera is at present still very problematical, since very few comparative studies have as yet been made. From anatomical and ontogenetic study it is apparent that *Omphalia* (and *Mycena*) represent an unnatural group even after separating from them the genus *Delicatula.* Certain species of the genus *Omphalia* (in the actual sense) show distinct relations to the genera *Clitocybe, Pleu-*

rotus, Hygrocybe, Lentinellus, Xerotus, as was repeatedly pointed out by FAYOD. This applies especially to the species *Omphalia fibula, scyphoides, campanella. Omphalia fibula* corresponds strikingly to the genus *Hygrocybe.* The whole group *Mycena-Omphalia* is considered as part of the *Clitocybeae* which comprise very different types of which the lowest ones show certain relations to the *Cantharellaceae* and *Hygrophoraceae.* These views resulting from anatomical and morphological facts are confirmed by the preliminary serodiagnostic study carried on especially by NEUHOFF and ZIEGENSPECK.