Studies on *Massarina* Sacc. and Related Genera

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Summary

The taxonomy of the genera *Massarina* Sacc., *Keissleriella* v. Höhnel and *Herpotrichia* Fuckel, together with their synonyms, is treated in this paper.

During the course of this investigation, 19 species of *Massarina,* including 7 new species, 11 of *Keissleriella,* including 2 new species, and 12 of *Herpotrichia* including 2 new species have been studied. The species are distinguishable in ascospore characteristics and also in the structure of the ascocarps, especially in the region of the porus. Keys have been provided for this purpose. In cultural experiments, a large number of the species have been found to be capable of producing their imperfect stages, all of them, so far discovered, belong to the *Sphaeropsidales.*

Although the three genera form a natural group, there is not enough justification for the creation of a new family as they can be easily grouped within the family *Pleosporaceae.* The family *Massarinaceae* proposed by Munk (1956) is based upon characters that cannot be treated as distinct from those present in *Pleosporaceae.*

Zusammenfassung

In der vorliegenden Arbeit werden die Ergebnisse einer systematischen Untersuchung der Ascomycetengattungen *Massarina* Sacc., *Keissleriella* v. Höhnel und *Herpotrichia* Fuckel mit ihren Synonymen dargestellt. Es wurden dabei 19 Arten von *Massarina,* darunter 7 neue, 11 Arten von *Keissleriella,* darunter 2 neue, 12 Arten von *Herpotrichia,* darunter 2 neue, erfaßt. Alle diese Arten lassen sich auf Grund ihrer Ascosporen unterscheiden, und darüber hinaus zeigen sie vielfach auch charakteristische Unterschiede im Fruchtkörperbau, besonders im Bereich der Mündungen. Bestimmungsschlüssel erleichtern das Auffinden der unterschiedenen Arten. An Hand von Kulturversuchen konnten von einer größeren Zahl von Arten sphaeropsidale Nebenfruchtformen nachgewiesen werden.

Obwohl die drei Gattungen eine natürliche Gruppe bilden, lassen sie sich zwanglos in die Familie der *Pleosporaceae* einordnen. Eine Familie der *Massarinaceae,* wie sie von Munk (1956) vorgeschlagen worden ist, ließe sich nicht genügend von den *Pleosporaceae* trennen.

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Literature cited

BERKLEY, J. M., and C. E. BROOME, 1861: Notices of British Fungi. Ann. Mag. Nat. Hist. Ser. 3, 7, no. 952—985.

BOOTH, C., 1957: Studies of Pyrenomycetes: I. Four species of *Chaetosphaeria*, two with catenulate conidia. II. *Melanopsamma pomiformis* and its *Stachybotrys* conidia. Mycological Paper no. 68, Commonwealth Mycol. Inst. Kew.

BREFELD, O., 1891: Untersuchungen aus dem Gesamtgebiete der Mykologie. IX. Die Hemiasci und die Ascomyceten. Münster i. W.

BRUNAUD, P., 1887: Champignons nouvellement observés aux environs d Saintes. J. d'hist. natur. de Bordeaux et Sud-Ouest 41, 1—7.

CLEMENTS, E. C., and C. L. SHEAR, 1931: The Genera of Fungi. New York.

CORBAZ, R., 1957: Recherches sur le Genre *Didymella* Sacc. Phytopath. Z. 28, 375—414.

CORDA, A. C. I., 1840: Icones fungorum hucusque cognitorum. Prague 4, 1—49.

ELLIS, J. B., and B. M. EVERHART, 1886: New species of fungi from various localities. J. Mycol. 2, 99—104.

— —, 1892: North American Pyrenomycetes. New Jersey.

FRIES, E. M., 1822: Systema Mycologicum 2[1], pp. 620.

FUCKEL, L., 1869: Symbolae Mycologicae Beiträge zur Kenntnis der rheinischen Pilze. Jb. Nassauisch. Ver. Naturk. 23—24, 1—459.

GWINNE-VAUGHAN, H. C. I., and B. BARNES, 1937: The Structure and Development of Fungi. 2nd ed., Cambridge Univ. Press.

HANSEN, H. N., and W. C. SNYDER, 1947: Gaseous sterilization of biological material for use as culture media. Phytopathology 37, 369—371.

HÖHNEL, F. VON, 1917: Fragmente zur Mykologie. XX. Mitteilung, no. 1031—1057. Sitzungsber. Kaiser Akad. Wissensch. Wien, Math.-naturw. Kl. 126[1], 353—399.

— —, 1918: Fungi imperfecti. Beiträge zur Kenntnis derselben. Hedwigia 59, 236—284.

— —, 1919: Fragmente zur Mykologie. XXIII. Mitteilung, no. 1154—1188. Sitzungsber. Kaiser Akad. Wissensch. Wien, Math.-naturw. Kl. 128[1], 535—625.

HOLM, L., 1957: Études taxonomiques sur les Pléosporées. Symb. Bot. Upsal. 14[3], 1—188.

KIRSCHSTEIN, W., 1939: Über neue, seltene und kritische Ascomyceten und Fungi imperfecti. II. Ann. Mycol. 37, 88—140.

MONTAGNE, J. F. C., 1834: Notice sur les plantes cryptogames récemment découvertes de quelques espèces les plus rares de la flore française. Ann. des sc. nat., ser. 11, 1, 295—307.

MÜLLER, E., 1950: Die schweizerischen Arten der Gattung *Leptosphaeria* und ihre Verwandten. Sydowia 4, 185—319.

— —, 1955: *Leptoguignardia*, eine neue Gattung der bitunicaten Ascomyceten. Sydowia 9, 216—220.

MUNK, A., 1953: The system of the Pyrenomycetes. A contribution to a natural classification of the group Sphaeriales sensu Lindau. Dansk. Botanisk Arkiv 15[2], 1—163.