

REVIEW

EDWIN HORACE DAUBS, *A monograph of Lemnaceae*. — Illinois Biological Monographs 34 (1965) 118 pp., incl. 21 plates. The University of Illinois Press, Urbana. — \$ 3.50.

There has not been an extensive taxonomical treatment of the *Lemnaceae* since the publication of the famous works of Hegelmaier (1868, 1895). As the quantity of preserved and dried material of this family has increased considerably since Hegelmaier's time, and as some new species have been described and the flowers and fruits of some other species have become known, there is, according to Daubs, a 'need for a critical review of the family in the light of this later knowledge, as well as some synthesis of the widely scattered data into a more readily available form'.

I have used this revision and it must at once be praised for the clear and adequate descriptions of the taxa and the excellent, accurate drawings.

The keys do work well. I have one remark here for the key to the genera, as *Spirodela* is here characterized as having 'mature plants 5 mm or more in length', though in the descriptions of the species it appears that *S. oligorrhiza* is $2\frac{1}{2}$ —5 mm and *S. punctata* only 2— $3\frac{1}{2}$ mm long, so that this character does not hold for 2 of the 5 species in the genus.

No chapters are included about the life-cycle and the ecology of *Lemnaceae*; the author obviously assumes that this is all well-known. But some terms should have been explained; for example 'reproductive pouch' is somewhat misleading, as it refers to the sacs in which the new fronds are formed, not to the flowering cavities.

The material on which Daubs apparently based his work appears very limited, because he studied only the material from 9 herbaria in the U.S.A. (4000 sheets). How he dealt with the type material of many species preserved in European herbaria is not clear, and this affects of course both the synonymy and the taxonomic account.

It affects also the distributional data reproduced on the maps which the author believes to be fairly detailed. However true this may be for the Americas, they cannot be very accurate for the rest of the world. Of *Wolffiella welwitschii* the area is delineated; of the others localities are dotted, but it is confusing that sometimes the dots are used for 'hatching' a regional area.

Unfortunately the work is not concluded by an index of names. There is also not a list of lemnaceous taxa of uncertain status, or of taxa excluded from the family, and no list of dubious names.

This has led me to inspect Index Kewensis and other works to see in how far the nomenclature and synonymy is covered.

It appeared that Index Kewensis alone gives 21 specific names which are not mentioned, let alone evaluated in Daubs's work; only a few of them have no proper nomenclatural status in having been published only in synonymy, and some others are not any longer classified among *Lemnaceae*. But many others should have been evaluated, e.g. *Wolffia schleidenii* Miq. from Java.

The complete list of omitted combinations and names *) runs as follows:

Grantia brasiliensis (Weddell) Mac Mill., *Metasp.* Minn. (1892) 134.

Grantia columbiana (Karsten) Mac Mill., l.c. 135.

Horkelia arrhiza (L.) Druce, *Fl. Berks.* (1898) 511.

Hydrophace minor (L.) Bubani, *Fl. Pyren.* 4 (1897) 23.

Hydrophace trisulca (L.) Bubani, l.c. 23.

*) *Lemna conjugata* Willd. ex Schleid. in *Linnaea* 13 (1839) 391, *nomen in synon. sub Lemna minor* L.

Lemna cordata Sessé & Moc., *Pl. N. Hispan.* ed. 1 (1887—1890) 159 (*La Naturaleza* ser. II, 1 App.).

Lemna dimidiata Rafin. in *Amer. Monthly Mag.* 2 (1817) 43.

*) *Lemna microscopica* Schur, *Enum. Pl. Transs.* (1866) 635, *nomen in synon. sub Telmatophace arrhiza* (L.) Schur.

*) *Lemna quadrijolia* Steud., *Nom. ed.* 1 (1823) 469.

Lemna valdesiana S. Wats. in *U. S. Geol. Expl. 40th parallels* (cited in *Ind. Kew. as Bot. King's Exp.*) (1871) 336.

Lenticula palustris Garsault, *Fig. Pl. Anim. Med.* (1764) t. 336; *Descr. Pl. Anim.* (1767) 206.

*) *Lenticula ramosa* Lamk, *Fl. Fr.* 2 (1778) 189.

Lenticularia Mich. ex Montand., *Guide Bot.* (1868) 308.

Lenticularia monorhiza Montand., l.c. 308.

*) The names checked by myself are marked with an asterisk.

- *) *Telmatophace cylindracea* Welw. ex Hegelm., Lemnaceen (1868) 123, *nomen in synon. sub Wolffia cylindracea* Hegelm.
- *) *Telmatophace generalis* E. H. L. Krause in Sturm, Fl. Deutschl. ed. 2, 1 (1906) 184, *nomen in synon. sub Lemna gibba* L.
- *) *Wolffia floridana* (J. D. Smith) Hegelm. in Bot. Jahrb. 21 (1895) 305, *nomen*, without reference to Smith's publication.
- *) *Wolffia schleidenii* Miq. in Nederl. Kruidk. Arch. 3 (1855) 428.
- *) *Wolffiella hyalina* (Hegelm.) Monod in Mém. Soc. Hist. Nat. Afr. Nord, Hors-sér. 2, Trav. Bot. dédiés à René Maire (1949) 242.
- *) *Wolffiella repanda* (Hegelm.) Monod, l.c.

Daubs recorded 3 names that are not incorporated in the Index Kewensis, viz.:

- *) *Lemna cherokensis* Schweinitz ex Hegelm. in Bot. Jahrb. 21 (1895) 297, *nomen*.
- Lemna monorhiza* Montand., Guide Bot. (1868) 308.
- *) *Lemna pusilla* Hegelm., Lemnaceen (1868) 147. This is incorrect as Hegelmaier did not use this binomial; a description of *Lemna oligorrhiza* γ *pusilla* Hegelm., however, is found on p. 149.

When checking some of Daubs's records I found another 4 names which are given neither in his monograph, nor in the Index Kewensis, viz.:

- *) *Spirodela javanica* (Hegelm.) Hegelm. in Bot. Jahrb. 21 (1895) 288.
- *) *Spirodela melanorrhiza* (F. v. M. ex Kurz) Hegelm., l.c. 287.
- *) *Spirodela pleiorrhiza* (F. v. M. ex Kurz) Hegelm., l.c. 288.
- *) *Spirodela pusilla* (Hegelm.) Hegelm., l.c. 287.

In the following 6 cases Daubs did not refer to the first publication of the name, at least if compared with Index Kewensis. This is rectified here as follows:

- Lemna aequinoctialis* Welw., Apontam phytogeogr. sobre a flora da prov. de Angola in Anaes do Conselho ultram. Dec. 1858, nr. 55 (1858?) 543.
- *) *Lemna angolensis* Welw. ex Hegelm. in J. Bot. 3 (1865) 112.
- Lemna intermedia* Ruthe, Fl. Mark Brandenb. und Niederlausitz, ed. 2 (1834) 277.
- Lemna minuta* Rafin. in Med. Repos. N. York 5 (1808) 352.
- *) *Lemna obcordata* Vahl, Symb. Bot. 2 (1791) 95.
- *) *Wolffiella welwitschii* (Hegelm.) Monod, Mém. Soc. Hist. Nat. Afr. Nord, Hors-sér. 2, Trav. Bot. dédiés à René Maire (1949) 229, 242.

In the following 3 cases either the author's name had not been quite correctly cited or another omission had been made. They are rectified here as follows:

- *) *Lemna minima* Humb. ex Philippi in Linnaea 33 (1864) 239 was published as a *nomen*. The correct name and reference of the species described as *Lemna minima* Philippi in Daubs's monograph is *Lemna miniscula* Herter, Rev. Sudamer. Bot. 9 (1954) 185.
- *) *Lemna tenera* Kurz, J. As. Soc. Bengal 40, part ii (Nat. Hist.) (1871) 78. Daubs erroneously stated under *Lemna trisulca* that this was not actually published as a binomial.
- Wolffia arrhiza* (L.) Horkel ex Wimmer, Fl. Schles. ed. 3 (1857) 140.

It is regrettable that not a single remark has been made about the affinities within the genera. This would have been interesting in particular with respect to the genera *Wolffia* and *Wolffiella*. Within *Wolffiella sensu* Daubs *W. welwitschii* is in a very special position as it possesses a flowering cavity on both sides of the median line; the other species of the genus have only one lateral flowering cavity. Within the genus *Wolffia sensu* Daubs the two African species *W. repanda* Hegelm. and *W. hyalina* (Delile) Hegelm. belong definitely to a special section which forms the bridge with *Wolffiella*. Both species have a lateral flowering cavity and an elongate stipe, which are typical characters of *Wolffiella*; Monod (1949) actually transferred them to *Wolffiella*. In the other *Wolffia* species the flowering cavity is median and they do not have a stipe.

The flat form of *Lemna gibba* L. is clearly different from *L. minor*. Daubs very sensibly has made this already apparent in the key. According to Mason (1957) this flat form of *L. gibba* is able to achieve its generative cycle without becoming gibbous; therefore, it now has to be proved that it is indeed a form of *L. gibba* and not a separate taxon as Daubs himself stated that 'there is not a continuous gradation between the gibbous and the flatter forms.'

From the above given constructive critical remarks follows that, notwithstanding the merits of the work, it covers by no means all matter which could be expected to be contained in a monograph. It is to be hoped that continued work will lead to replace this tentative survey by a future new edition of a more monographic character.

C. DEN HARTOG

*) The names checked by myself are marked with an asterisk.