8. NOMENCLATURE

8.1. TYPIFICATION AND VALIDITY OF NAMES

8.1.1. General remarks

The valid and synonymous names of genera and species are listed in DEN HARTOG and VAN DER PLAS (1970). Some additions and changes are given and substantiated below. Unfortunately, it was necessary to change some commonly used names because the nomenclature rules do not permit the conservation of species names. Typification of genus names are adopted from DEN HARTOG and VAN DER PLAS (1970). The typification of recognized species names had to be rechecked.

The most important herbaria of Lemnaceae taxonomy are the following. The Lemnaceae herbarium of Hegelmaier is found in Ludwigsburg, Württemberg, Western Germany (STU); the one of Thompson in Lawrence, Kansas, U.S.A. (KANU, see HAUSER 1977) with many duplicates in St.Louis, Missouri, U.S.A. (MO); the herbarium of Daubs is located in Urbana, Illinois, U.S.A. (ILL); the one of Walo Koch and of the present author is in Zürich, Switzerland (ZT). The locations of other important collections can be derived from chapter 6.1.3, which lists the localities of the various species. Many collections were distributed to several herbaria. But it is not always advisable to regard the samples as identical copies. Some of the collections of Hahn, for example, originating from Mexico and distributed under the same year of collection, (1868, 1869 etc.) do not show exactly the same composition of species (the collections contain up to 11 species). This leads to the conclusion that collections distributed under the same label are not collected at exactly the same place or time. In my experience, it is also possible that sometimes labels or samples that are not properly fixed cause confusion.

For the species described by Linné (S. polyrrhiza, L. gibba, L. trisulca, W. arrhiza), there are only samples of L. minor and L. trisulca documented. Vouchers of both species are kept in the Linnaean herbarium in London (SAVAGE 1945). In the Linnaean herbarium in Stockholm, there are only two samples from Solander of L. trisulca (NORDENSTAM in lit.). In

the Linné herbarium in Helsinki, there is no example of Lemnaceae (KUKKONEN in lit.). Since the species described by Linné are the only European ones and their descriptions are clear and have never led to any confusion, it is possible to dispense with typification.
HEGELMAIER (1868, 1871, 1895) normally indicated the collections from which he described new species. However, he cited several collections and did not mention the herbarium to which the types belonged. Therefore typification of the names given by HEGELMAIER was based on his own herbarium (STU). If there was only one cited sample in the herbarium marked with n.sp., the sample was considered a holotype; in all other cases a lectotype was denoted. A duplicate of a type collection from the herbarium of Hegelmaier (STU) was also considered as a lectotype of an older species name if the sample from which the species was originally described could not be located. DAUBS (1965) indicates in his monography the type collection and the herbarium which he consulted, but he did not choose lectotypes.
Type collections of synonyms have not been traced out consistently. In some cases where the type collection could be localized the herbarium is cited in brackets behind the name.

8.1.2. Names of family, subfamilies, genera and species

Family Lemnaceae Dumortier (Fl.Belg., 147; 1827)

An older name (Lemnadeae) was used by S.F. GRAY (Nat.Arr.Brit.Pl. **2**, 729; 1821), but is not the correct form. The familiy is morphologically and ecologically rather isolated. Circumscription of the family has never been a serious problem, as distinction of two units within the family has been agreed upon by most authors, too. HEGELMAIER (1868, 1895) considered the units as tribus and called them Lemneae and Wolffieae. ENGLER (1889), ASCHERSON and GRAEBNER (1904), LUDWIG (1909), LAWALREE (1945) and DEN HARTOG and VAN DER PLAS (1970) distinguished the subfamilies Lemnoideae and Wolffioideae. The two subfamilies are well separated.

8.1.2.1 Subfamily: Lemnoideae Engler (in ENGLER and PRANTL, Nat.Pfl.f. II, 3, 163: 1889)

The subfamily of Lemnoideae consists of two genera. Some authors (e.g. HUTCHINSON 1934) do not recognize Spirodela as a separate genus. Indeed, the differences between Spirodela and Lemna are not very great, and, superficially, S. punctata looks similar to Lemna. But, nevertheless there are quite a few distinct differential characteristics on morphological and biochemical bases: Spirodela has a prophyllum at the base of the frond, druses, pigment cells, more than 1 root, better development of tracheids, etc. There is no valid reason to revoke a distinction which has been accepted by most taxonomists.

8.1.2.1.1. Genus Spirodela Schleiden (Linnaea **13**, 91; 1839)

Type species: S. polyrrhiza (L.) Schleiden
There has been some discussion as to whether Lenticula Hill (1757) or Lenticularia Séguier (1754) has priority over the name Spirodela. As DEN HARTOG and VAN DER PLAS (1970) point out, the name Lenticula is a synonym of Lemna. DEN HARTOG and VAN DER PLAS (1970) preferred the conservation of the name Spirodela to the use of the earlier name of Lenticularia in order to avoid nomenclatural changes. McVAUGH (1972) made clear that this conservation is unnecessary since Lenticularia polyrrhiza is not the type species of the genus. Lenticularia is therefore a synonym of Lemna.

Section Spirodela

Type species: S. polyrrhiza (L.) Schleiden
For this section HEGELMAIER (1868) used the name "Typus der S. polyrrhiza". KOCH (1933) distinguished a section Polyrrhizae, but he had only S. polyrrhiza within this section and made a section Intermediae comprised of S. intermedia (and S. biperforata). This splitting is not justified since the two species are actually closely related and very difficult to distinguish from another (see chapter 9).
The name of Lemna polyrhiza described by Linné has priority and gives no problem of identification, although its type collection is not known. The two names of KOCH (1932, 1933) for his newly described species

S. intermedia and S. biperforata are the oldest validly published names for South and Central American species of Spirodela except S. punctata. As they describe plants of the same species, the older name S. intermedia has priority. DEN HARTOG and VAN DER PLAS (1970) suggest that an investigation be made of the type of L. therminalis Beauvois, which might be identical to "S. biperforata" = S. intermedia. Since the type collection of L. therminalis originates from Virginia, U.S.A., it is identical with S. polyrrhiza, the only species of this section occurring in North America. It was checked by the present author and identified as S. polyrrhiza. However, the identity of L. punctata G.F.W. Meyer is not quite sure. The type collection is lost. The description of L. punctata could also fit that of poorly developed plants of S. intermedia which occur near the original type locality (Essequibo River, Guayana). S. punctata is rather rare in South America. The only known localities where it has been found are the southern tip of South America (Tierra del Fuego) and the region of Rio de Janeiro (known since 1874) where it is now frequent. A Columbian collection (Molinia 18Va, 224: COL) contains a single group of S. punctata. It is possible that this loose group was included by mistake. Thompson retypified the species name of S. punctata very clearly. His typification has been accepted for a long time.

1. **Spirodela intermedia** W.Koch (Ber.Schweiz.Bot.Ges. **41**, 114; 1932)

   Spirodela biperforata W.Koch (Ber.Schweiz.Bot.Ges. **42**, 188; 1933)(ZT)

   Type collection. Uruguay, Montevideo; leg. J. Arechavaletta 2502, 1., 1877.
   Holotype: ZT. Isotypes: ZT

2. **Spirodela polyrrhiza** (L.) Schleiden (Linnaea **12**, 392; 1839)

   Lemna polyrhiza L. (Sp.plant. ed.1, 970; 1753)
   Lenticula polyrhiza Lam. (Fl.Fr. **2**, 189; 1778)
   Lemna obcordata Beauv. (J.Phys.Chim.Hist.Nat. **82**, 113; 1816) (PH)
   Lemna thermalis Beauv. (J.Phys.Chim.Hist.Nat **82**, 102, 113; 1816) (PH)
   Lemna orbiculata Roxb. (Fl.Ind. **3**, 565; 1832)
   Thelmatophace polyrrhiza Godr. (Flor.Lorr. **3**; 1843)
   Lemna major C.A.Meyer ex Griff. (Not. **3**, 216; 1851)
   Telmatophace orbicularis Schur (Enum.Pl.Transs., 635; 1866)
   Spirodela atropurpurea Montand. (Guid.Bot. 309; 1868)
   Lemna maxima Blatter and Hallb. (J.Ind.Bot. **2**, 49 (1922)
   Spirodela maxima McCann (J.Bombay Nat.Hist.Soc. **43**, 158; 1942)
   Spirodela polyrhiza var. Masonii Daubs (Monogr.Lemnac. 13; 1965)(ILL)

Type collection. Not known. There are no specimens of "Lemna polyrhiza" in the Linnaean herbaria of London, Stockholm, and Helsinki, The description is based on European material; the identity of S. polyrrhiza is unmistakable.

Linné wrote the name "polyrrhiza" with one r; however, the name of Lemna arrhiza with two r's (1771). Since Linné used the more correct spelling with two r's for the latter name, it is assumed that the spelling of "polyrhiza" with one r is an unintentional orthographic variant. Therefore we use here the name polyrrhiza with two r's in analogy of the name "arrhiza" and in accordance with most European authors (HEGELMAIER 1868, 1895).

Section Oligorrhizae W.Koch (Ber.Schweiz.Bot.Ges. **41**, 114; 1933)

S. punctata is the only species of this section. There are many other species described within this section, but all are identical with S. punctata (see chapter 9).

3. **Spirodela punctata** (G.F.W.Meyer) Thompson (Rep.Mo.Bot.Garden **9**, 28; 1898)

Lemna punctata G.F.W.Meyer (Prim.Fl.Esseq. 262; 1818)
Lemna oligorrhiza Kurz (J.Linn.Soc.London **9**, 267; 1866) (K, MEL)
Lemna melanorrhiza F.v.M. ex Kurz (J.Bot. **5**, 115; 1867) (CAL, G, GH, K, L, MEL, STU, ZT)
Lemna pleiorrhiza F.v.M. ex Kurz (J.Bot. **5**, 115; 1867) (STU)
Spirodela oligorrhiza Hegelm. (Die Lemnaceen, 147; 1868)
Spirodela melanorrhiza Hegelm. (Bot.Jahrb. **21**, 287; 1895)
Spirodela pusilla Hegelm. (Bot.Jahrb. **21**, 287; 1895) (STU)
Spirodela pleiorrhiza Hegelm. (Bot.Jahrb. **21**, 288; 1895)
Spirodela javanica (Bauer) Hegelm. (Bot.Jahrb. **21**, 288; 1895) (KANU, STU)

Type collection. The present location of original collection of G.F.W. Meyer from Essequibo River is not known; it is probably lost. A new type collection was chosen by THOMPSON (1898): Chile, Tierra del Fuego Island, Orange Harbor; leg. Wilkes Expedition 1838. Neotype: US. Isotypes: DS, GH, KANU, MO.

Typification is based on the collection from Orange Harbor; these plants are identical with plants from other continents. If it is accepted that there is no recognizable differentiation within this group, the valid name is S. punctata, in accordance with DEN HARTOG and VAN DER PLAS (1970). The frequently used name S. oligorrhiza becomes a synonym.

8.1.2.1.2. Genus Lemna L. (Sp.Pl.ed.1, 970; 1753)

Lenticularia Seguier (Pl.Veron. **3**, 129; 1754)
Lenticula Hill (Brit.Herb., 531; 1757)
Hydrophace Hall. (Hist.Stirp.Indig.Helv. **3**, 68; 1768)
Telmatophace Schleid. (Linnaea **13**, 391; 1839)
Staurogeton Rchb. (Nom., 33; 1841)

Type species. L. minor (cf. the detailed argumentation of DEN HARTOG and VAN DER PLAS 1970 based on the generic diagnosis of Linné in Gen.Pl. ed. **5**, 417; 1754).

Section Lemna

Type species. L. minor L.

(HEGELMAIER 1868) used the name Eulemna for a section of all Lemna species except L. gibba and L. trisulca. Later (1895) he restricted the section under the name Lemna to L. minor and L. disperma. The section Lemna of the present work comprises the sections Lemna and Telmatophace (Schleid.) of HEGELMAIER (1895), which together contain seven species. It is not justified to keep the section Telmatophace which is characterized by several ovules per ovary. There are some L. gibba plants that have ovaries with only one ovule. On the other hand, L. disperma, belonging to section Lemna of HEGELMAIER has one or two ovules (see chapter 9.2.3.2.).

4. Lemna gibba L. (Sp.Pl.ed.1, 970; 1753)

Lenticula gibba Moench (Meth., 319; 1794)
Lenticula gibbosa Renault (Fl.Dep.Orne, 40; 1804)
Telmatophace gibba Schleid. (Linnaea **13**, 391; 1839)
Telmatophace gibbosa Montand. (Guid.Bot., 308; 1868)
Lemna cordata Sessé and Moc. (Pl.N.Hispan.La Naturaleze ser. II, **1**, App. 159; 1890)
Lemna Parodiana Giardelli (Notas Mus.La Plata **2**, 12, 97-100; 1937) (LP, UC, ZT)

Type collection. Not known. There are no specimens of L. gibba in the Linnaean herbaria of London, Stockholm and Helsinki. The description is based on European material and is accurate.

5. **Lemna disperma** Hegelm. (Bot.Z. **29**, 654; 1871)

Lemna disperma var. fallax Hegelm. (Bot.Jahrb. **21**, 291; 1895) (K, L)

Type collection. Western Australia, Swan River; leg. Drummond 1845. Lectotype: STU. Isotype: K.

6. **Lemna minor** L. (Sp.Pl. ed. 1, 970; 1753)

Lenticula minor Scop. (Fl.Carn. 2nd ed., **2**, 213; 1772)
Lenticula vulgaris Lamk. (Fl.Fr. **2**, 189; 1778)
Lemna vulgaris Lamk. (Encycl. **3**, 464; 1792)
Lemna minima Thuiller ex Beauvois (J.Phys.Chim.Hist.Nat. **82**, 113; 1816) (G)
Lemna minor var. minima Chev. (Fl.Paris **2**, 256; 1827)
Lemna minor var. oxymitra Hegelm. (Lemnaceen, 143; 1868) (STU)
Lenticularia monorhiza Montand. (Guid.Bot., 308; 1868)
Hydrophace minor Bubani (Fl.Pyren. **4**, 23; 1897)
Lemna rwandensis de Sloover (Bull.Jard.Bot.Belg. **43**, 366; 1973) (BR)

Type collection. There is a sample of L. minor in the Linnaean herbarium in London (BM) without specification of origin which should be considered as lectotype.

7. **Lemna japonica** Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 23; 1980)

Type collection. Japan, Kyushu, Fukuoka, Mizumaki-machi; leg. K. Okutomi, 19.10.1969; ETH collection number 7182. Holotype: ZT.

8. **Lemna ecuadoriensis** Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 22; 1980)

Type collection. Ecuador, Prov. El Oro, between Machala and Santa Rosa, 300 ft., drainage ditch; leg. T. Plowman, L. Jacobs, E.W. Davis 4609; 2.12.1974. Holotype: U. Isotypes: F, GH.

9. **Lemna obscura** (Austin) Daubs (Monograph. Lemnaceae, **20**; 1965)

Lemna minor var. obscura Austin in Gray (Man.Bot.ed. 5, 479; 1867)
Lemna minor var. orbiculata Austin in Gray (Man.Bot.ed. 5, 479; 1867)
Lemna minor var. colorata Hegelm. p.p. (Lemnaceen, 144; 1868)

Type collection. New Jersey, New Durham Meadows; leg. C.T. Austin 8050; 1862. Lectotype: MO (DAUBS 1965). Isotypes: NY, STU.

10. Lemna turionifera Landolt (Aquatic Botany **1**, 355; 1975)

Type collection. Montana, Lincoln Co., 20 km W of Davensport; leg. Wm. M. Hiesey 196; 1953; ETH collection number 6573. Holotype: ZT.

Section Hydrophylla Dumortier (Fl.Belg., 165; 1827)

Subgen. Staurogeton Rchb. (Fl.Germ. **1**, 10; 1830)
sect. Staurogeton Endl. (Gen.Pl.Suppl., 1369; 1840)
subgen. Hydrophace sect. Staurogeton Hegelm. (Lemnaceen, 133, 1868)

Type species. L. trisulca L.

L. trisulca is the only species of this section.

11. Lemna trisulca L. (Sp.Pl. ed. 1, 970; 1753)

Lenticula trisulca Scop. (Fl.Carn., ed. 2, 213; 1772)
Lenticula ramosa Lamk. (Fl.Fr. **2**, 189; 1778)
Lemna cruciata Roxb. (Fl.Ind. **3**, 566; 1832)
Lemna intermedia Ruthe (Fl.Mark Brandenburg und Niederlaus. ed. 2, 277; 1834)
Lemna bisulca C.A.Meyer (Beitr.Fl.Russ.Reich **9**, 104; 1854)
Staurogeton trisulcus Schur (En.Pl.Transs., 636; 1866)
Staurogeton trisulcum Montand. (Guid.Bot. 308; 1868)
Hydrophace trisulca Bubani (Fl.Pyr. **4**, 34; 1897)
Lemna trisulca var. pygmaea P. Hennings (Verh.Bot.Ver.Prov. Brandenburg **33**, 8; 1891)

Type collection. There is one specimen of L. trisulca in the Linnaean herbarium in London (BM) (with no specification of origin) which should be considered as lectotype.

Section Alatae Hegelm. (Bot.Jahrb. **21**, 294; 1895)

Type species. L. perpusilla Torrey

In 1843 TORREY named a plant that he found near New York L. perpusilla. HEGELMAIER (1868) separated L. paucicostata from this species because the seeds had a different number of ribs. Later, THOMPSON (1898) neglected this species of HEGELMAIER. He apparently found in the region of St.Louis, Missouri, populations of L. perpusilla L. with varying numbers of ribs. Therefore he was of the opinion that L. perpusilla s.l. had a

great variability in the number of ribs and that a distinction of two separate species was not justified. All American and many other authors have followed THOMPSON. It was KANDELER and HUEGEL (1974a) who supported the existence of two different species and worked out many good characteristics for separating the taxa (see chapter 9.2.3.4.). THOMPSON just investigated populations in a region where both species occur. HEGELMAIER (1868) distinguished a third species within the group which he called L. angolensis, from specimens collected and described by WELWITSCH. But WELWITSCH had already published the new species in 1859 under the name of L. aequinoctialis. DEN HARTOG and VAN DER PLAS (1970) considered the name L. aequinoctialis as synonymous to L. perpusilla (including L. paucicostata). Comparisons made in our laboratory between clones from L. paucicostata from all over the world showed that there is no separation possible between clones that exactly fit the description of L. aequinoctialis and all the other clones. Therefore, the name of L. paucicostata had to be abandoned in favour of the earlier name L. aequinoctialis. This changing of names was rather embarrassing since some clones of L. perpusilla s.l. had been used for physiological investigations. The clone 6746 was distributed under the name L. perpusilla, changed later to L. paucicostata and finally ended up with the name L. aequinoctialis. Unfortunately, there was no way to conserve the name of L. paucicostata. When the late Dr. Wm.S. HILLMAN (Brookhaven, NY) learned that the name L. paucicostata had to be changed again, he wrote to me in an understandable reaction: "I am filled with horror or laughter (I am not sure which) at the thought of again changing the name under which we write articles about poor old 6746 and its brethren. And the names get worse and worse for the ordinary (English-speaking anyway) person to handle: perpusilla → paucicostata → aequinoctialis ... And please, I do beg of you, conceal the reference from me as long as possible, since people who read the physiological literature tend to be intolerant of such things". L. trinervis (Austin) Small is a name used by American authors for flat and thin fronds of partly L. perpusilla and partly L. aequinoctialis. In a similar way, the name L. Blatteri was used by McCANN (1942) for flat fronds of L. aequinoctialis with indistinct papules. The names L. aoukikusa and L. aoukikusa ssp. hokurikuensis are proposed by BEPPU et al. (1985) for distinct Japanese races of L. aequinoctialis.

12. Lemna perpusilla Torrey (Fl.N.Y. **2**, 245; 1843)

Lemna perpusilla var. trinervis Austin (in A. GRAY: Man.Bot. 5th ed. 479; 1867) (F, GH, KANU, MO, STU)
Hydrophace perpusilla Lunell (Am.Midl.Natur. **4**, 237; 1915)

Type collection. New York, Staten Island; leg. J. Torrey 1829. Lectotype: STU. Isotypes: GH, KANU, MO, NY.

13. Lemna aequinoctialis Welwitsch (Ann.Conselho Ultram. **55**, 578;1859)

Lemna angolensis Welw. ex Hegelm. (J.Bot. **3**, 112; 1865)
Lemna paucicostata Hegelm. (Lemnaceen, 139; 1868) (STU)
Lemna paucicostata var. membranacea Hegelm. (Lemnaceen, 141; 1868)
Lemna trinervis Small (Fl.SE.U.S., 230; 1903)
Lemna minima Blatt. and Hallb. (J.Ind.Bot. **2**, 50; 1921)
Lemna Blatteri McCann (J.Bombay Nat.Hist.Soc. **43**, 153; 1942)
Lemna Eleonorae McCann (J.Bombay Nat.Hist.Soc. **43**, 153; 1942)
Lemna aoukikusa Beppu et Murata (Acta Phytotax.Geobot **36**, 35; 1985)

Type collection. Angola, Prov. Luanda, Distr. Luanda; leg. F. Welwitsch No. 206; 1858. Lectotype: STU. Isotypes: BM, G, K, ZT.

Section Biformes sect.nov.

Frondes steriles submerses elongatae acutaeque non coloratae. Radix cum vagina non alata. Frondes fertiles summa aqua natantes, ovatae.

Type species. Lemna tenera Kurz
L. tenera is the only species of this section

14. Lemna tenera Kurz (J.Ass.Soc.Beng. **40**, 78; 1871)

Type collection. Burma, Pegu, Pazwoodoung Valley, in a forest swamp; leg. S. Kurz, 12.1870. Lectotype: STU. Isotype: K.

Section Uninerves Hegelm. (Bot.Jahrb. **21**, 296; 1895)

Type species. L. valdiviana Phil.
The oldest name of the section is L. minuta Raf., which is mentioned in Med.Repos II, **5**, 353 (1808) together with many other new species but

without a description. The name is nomen nudum and the identity not clear. The name of L. minuta was first published validly by HUMBOLDT, BONPLAND and KUNTH in Nova Genera Species Plantarum (1816) with the following description: "Lemna radicibus solitarii; frondiculis ellipticis, enerviis. Innatans aquis stagnantibus prope Guadas Novogranatensium, alt. 580 hex. Radices simplices, solitariae, capillaceae, centrales, subpollicares. Frondiculae natantes subrotundo-ellipticae, integerrimae, planae?, enerviae, laete virides, glabrae, vix lineam longae. Flores et fructus ignoti. Lemnae minori proxima". The character "frondiculis enerviis" is not known in any Lemna species. An identity with L. minuscula as proposed by REVEAL in CRONQUIST et al. (1977) is quite uncertain. The described species could as well be L. valdiviana or L. aequinoctialis. Both species are quite common in the warm tropical region of Columbia, whereas L. minuscula is distributed only in the higher altitudes. Unfortunately, I was not able to find the type collection (in any of the following herbaria: B, G, JE, P) and it must be assumed that it has been lost. HEGELMAIER (1868) writes that he could not discover this type specimen ("Schleiden zieht den obigen Namen als Synonym zu L. minor; allein die von diesem Autor urkundlich benützten Original-Exemplare von L. minuta Humb. scheinen verloren gegangen zu sein"). As long as the identity of the newly described species remains unclear, it should not be taken into account. The same name was used by KUNTH (Syn.Pl. Aequin. **1**, 136; 1822); later (1841) he changed the name to L. minima and placed it in synonymy with L. minor. The name of L. minima was first validly published by THUILLER in DE BEAUVOIS (1816). After consultation of the herbarium of Thuiller in G, it is certain that the name was used for a collection of small-fronded L. minor (with 3 nerves). The name is therefore synonymous with L. minor. HEGELMAIER (1895) was not correct in using the name for L. minuscula with Philippi as author. PHILIPPI distributed herbarium samples in 1857 under the name L. minima. Later (1864), he attributed the name to Humboldt as author.

Another old name belonging to the section Uninerves is L. minor var. cyclostasa Elliot (Bot. S.Carol. and Georgia **2**, 518; 1824). The name must be attributed to L. valdiviana. As a species name, L. cyclostasa (for L. valdiviana) was first introduced by THOMPSON (1898). SCHLEIDEN (1839) cites L. cyclostasa Ell. as a synonym of L. minor. The often cited combination L. cyclostasa (Ell.) Chev. 1827 (cf. THOMPSON 1898) does not exist (DEN HARTOG and VAN DER PLAS 1970). Meanwhile PHILIPPI (1864) had

described L. valdiviana and AUSTIN (1867) L. Torreyi. The name L. minuscula of HERTER (1954) is the first valid name for the species, generally called L. minima; the name is based on the collection from Santiago of 1857 distributed by Philippi under the name L. minima.
Unfortunately, the use of the different names within this section in the literature is not uniform. The present author used the name L. valdiviana for L. minuscula and the name L. Torreyi for L. valdiviana (LANDOLT and WILDI 1977) because the type collection of L. valdiviana had not yet been checked, and the specimen seen earlier from Chile belonged completely to L. minuscula. McCLURE and ALSTON (1966) applied the name L. valdiviana to L. minuscula, too. On the other hand, L. valdiviana was called L. minima.

15. Lemna valdiviana Phil. (Linnaea **33**, 239; 864)

Lemna minor var. cyclostasa Elliot (Bot.S.Carol. and Georgia **2**, 518; 1824)
Lemna Torreyi Austin (in A.Gray, Man.Bot. ed. 5, 479; 1867) (GH, KANU, MO, PH, STU)
Lemna valdiviana var pellucida Hegelm. (Lemnaceen, 138; 1868)
Lemna valdesiana S. Watson (U.S.Geol.Expl.40th parallel, 336; 1871)
Lemna valdiviana var. platyclados Hegelm. (in Mart., F.Bras. **3,2**, 19; 1878) (STU)
Lemna valdiviana var. robusta Hegelm. (Bot.Jahrb. **21**, 298; 1895) (STU)
Lemna cyclostasa Thompson (Rep.Mo.Bot.Gard. **9**, 35; 1897)

Type collection. Chile, Prov. Valdivia, S.Juan, Trembladerilla; leg. R.A. Philippi, 1. 1861. Lectotype: STU. Isotype: MO. Further samples collected by Philippi (e.g. G, S) which give only Chile as place of origin are probably from the same collection.

16. Lemna minuscula Herter (Rev. Sudamer.Bot. **9**, 185; 1954)

Lemna minuta H., B. and K. (Nov.Gen. et Sp. **1**, 372; 1816)
Lemna valdiviana var. minima Hegelm. (Lemnaceen, 138; 1868)
Lemna valdiviana var. abbreviata Hegelm. (in Mart., Fl.Bras. **3,2**, 19; 1878) (STU)
Lemna minima Phil. ex Hegelm. (Syst.Uebers.Lemn. Englers Bot.Jahrb. **21**, 299; 1895)

Type collection. Chile. Santiago; leg. R.A. Philippi, 5. 1857. Lectotype: STU. Isotypes: BM, G, GOET, K, LE, MEL, MO, S, SGO, UPS, ZT.

8.1.2.2. Subfamily Wolffioideae Engler (in ENGLER and PRANTL, Nat.Pfl.f.II, 3, 164: 1889)

Tribus Wolffieae Hegelm. (Lemnaceen, 121; 1868)

The subfamily of Wolffioideae consists of two genera (Wolffiella and Wolffia). DEN HARTOG and VAN DER PLAS (1970) divided the genus Wolffiella into three genera (Wolffiella, Pseudowolffia and Wolffiopsis), which in my opinion is not taxonomically justified (Wolffiopsis) and not equivalent to other genera within the family (Pseudowolffia) (see chapter 9.3.1).

8.1.2.2.1. Genus Wolffiella (Hegelm.) Hegelmaier (Bot.Jahrb. **21**, 303; 1895)

Wolffia subgen. Wolffiella Hegelm. (Lemnaceen, 131; 1868)

Type species. Wolffiella oblonga (Phil.) Hegelm.
DEN HARTOG and VAN DER PLAS (1970) proposed W. oblonga as a type species which is reasonable since it is the first known species of the four which HEGELMAIER (1895) placed in his genus Wolffiella.
The genus Wolffiella in the present definition was first established by MONOD (1949)

Section Stipitatae (Hegelm.) (Lemnaceen, 127; 1868; in the genus Wolffia)

Pseudowolffia Den Hartog and van der Plas (Blumea **18**, 365; 1970)

Type species. Wolffiella hyalina (Del.) Monod

17. W. hyalina (Del.) Monod (Mém.Soc.Hist.Nat.Afr.Nord, hors-sér. **2**, 242; 1949)

Lemna hyalina Delile (Fl.Egypt. 75; 1813)
Wolffia Delilii Schleid. (Linnaea **13**, 390; 1839)
Wolffia hyalina Hegelm. (Lemnaceen, 128; 1868)
Wolffiella Monodii Jovet-Ast (Bull.Inst.Fond.Afr.Noire **30**, 837-844; 1968) (P)
Pseudowolffia hyalina den Hartog and van der Plas (Blumea **18**, 366; 1970)
Pseudowolffia Monodii den Hartog and van der Plas (Blumea **18**, 366; 1970)

Type collection. Egypt; leg. Delile 877. Holotype: MPU. Isotypes: BM, MPU, P.

18. **W. repanda** (Hegelm.) Monod (Mém.Soc.Hist.Nat.Afr.Nord, hors-sér. **2**, 242; 1849)

Wolffia repanda Hegelm. (Lemnaceen, J.Bot. **3**, 113; 1865)
Pseudowolffia repanda den Hartog and van der Plas (Blumea **18**, 366; 1970)

Type collection. Angola, Distr, Luanda, Bemposta; leg. F. Welwitsch No. 205, 1854. Holotype: STU. Isotypes: BM, C, G, K, L, P. The holotype is the only sample of W. repanda in the herbarium Hegelmaier.

Section Rotundae sect.nov.

Frondes summa aqua natantes, subrotundae, sine cellulis pigmentiferis; stomata multa; sine appendiculo; flores 1 vel 2 pro fronde.

Type species. Wolffiella rotunda Landolt

19. **Wolffiella rotunda** Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 26; 1980)

Type collection. Zimbabwe, Distr. Urungwe, Zambesi Valley, west end of Kariba Gorge, alt. 1500 ft; leg. H. Wild 4265, 25.11.1953. Holotype: SRGH. Isotypes: B, K, LISU, MO, PRE, S, SRGH.

Section Wolffiella

Type species. W. oblonga (Phil.) Hegelm.

20. **Wolffiella neotropica** Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 26; 1980)

Type collection. Brazil, Rio de Janeiro, Recreiro Bandairantes, Canal das Tachas; leg. Segadas-Vianna, 25.11.1969, ETH collection number 7225. Holotype: ZT.

21. **Wolffiella Welwitschii** (Hegelm.) Monod (Mém.Soc.Hist.Nat.Afr.Nord, hors-sér. **2**, 242; 1949)

Wolffia Welwitschii Hegelm. (J.Bot. **3**, 114; 1865)

Wolffia conguensis Welw. ex Trimen (J.Bot. **4**, 223; 1866) (STU)
Wolffiopsis Welwitschii den Hartog and van der Plas (Blumea **18**, 366; 1970)

Type collection. Angola, Distr. Ambriz, prope Quizembo; leg. F. Welwitsch No. 209, Nov. 1853. Holotype: STU. Isotypes: BM, C, G, H, K, L. The holotype is marked by Hegelmaier with a hand-written Latin diagnosis.

22. **Wolffiella lingulata** (Hegelm.) Hegelm. (Bot.Jahrb. **21**, 303; 1895)

Wolffia lingulata Hegelm. (Lemnaceen, 132; 1868)

Type collection. Mexico, leg. L. Hahn, Mai 1868. Holotype: STU. It is very difficult to recognize isotypes because the different samples collected by Hahn, which have the same labels, are not identical in their composition of various species. The holotype is the only specimen marked with n.sp. by Hegelmaier.

23. **Wolffiella oblonga** (Phil.) Hegelm. (Bot.Jahrb. **21**, 303; 1895)

Lemna oblonga Phil. (Linnaea **29**, 45; 1857)
Wolffia oblonga Hegelm. (Lemnaceen, 131; 1868)
Wolffia lingulata var. minor Hegelm. (in Martius, Fl.Bras. **3,2**, 10; 1878) (STU)

Type collection. Chile, Santiago de Chile; leg. R.A. Philippi, May 1857. Lectotype: STU. Isotypes: BM, G, GOET, K, L, LE, MEL, MO, S, SGO, UPS, ZT.

24. **Wolffiella gladiata** (Hegelm.) Hegelm. (Bot.Jahrb. **21**, 304; 1895)

Wolffia gladiata Hegelm. (Lemnaceen, 133; 1868)
Wolffia gladiata var. floridana J.D.Smith (Bull.Torr.Bot.Club. **7**, 64; 1880) (GH, STU)
Wolffiella floridana Thompson (Rep.Mo.Bot.Gard, **9**, 37; 1897)

Type collection. Mexico; leg. L. Hahn. 1868. Lectotype: STU. In the herbarium STU, there are two samples collected by Hahn and marked by Hegelmaier with n.sp. Therefore it was not possible to designate a holotype. As the specimens collected by Hahn 1868 with the same labels are not identical, none were considered isotypes.

25. **Wolffiella denticulata** (Hegelm.) Hegelm. (Bot.Jahrb. **21**, 305; 1895)

Wolffia denticulata Hegelm. (Lemnaceen, 133; 1868)

Type collection. Cape; leg. Dr. Krauss; ex.herb. A. Braun. Holotype: STU. Isotypes: FI, G, JE, M, MO, TUEB, Z. Some of these specimens are still labeled with "Zitzikamaes". In Times Atlas (1977), Tsitsikama is situated 400-500 km E of Cape Town. Some of the samples have a different year on the label. All samples look identical and are together with Lemna ovata A.Br. (= L. minor). May 1834 seems to be the collection date. Other years (e.g. 1837, 1841, 1842) are probably not the collection dates but the date of distribution. WRIGHT (1909) designated a collection of Krauss from the environment of Durham, Natal as type collection of W. denticulata, because he did not know the herbarium Hegelmaier, and he was of the opinion that W. denticulata did not occur in Cape. But in the collection of Durham, W. denticulata is missing. Hegelmaier marked the first cited collection in his herbarium with n.sp. There is no reason to assume that this collection was not used by Hegelmaier to describe the new species.

8.1.2.2.2. Genus Wolffia Horkel ex Schleid. (Beitr.Bot. **1**, 233; 1844)

Grantia Griff. ex Voigt (Hort.Suburb.Calc., 692; 1845)
Bruniera Franch. (Billotia **1**, 25; 1864)

Type species. Wolffia Michelii Schleid. (identical to W. arrhiza)
DEN HARTOG (1969) proposed this name as a lectotype species in his efforts to conserve the genus name Wolffia. This proposal was accepted at the 12th Int.Bot. Congress. The original type species was Wolffia Delilii (SCHLEIDEN 1839), a synonym of Wolffiella hyalina. The change of W. hyalina from Wolffia to Wolffiella would have caused a number of annoying name changes.

Section Pseudorrhizae sect.nov.

Frondes summa aqua natantes, subrotundae, sine cellulis pigmentiferis; stomata multa; facies frondi inferioris in appendiculo cylindrico elongatae.

Type species. W. microscopica (Griff.) Kurz

26. Wolffia microscopica (Griff.) Kurz (J.Linn.Soc.Bot. **9**, 265; 1866)

Grantia microscopica Griff. ex Voigt (Hort.Suburb.Calc., 692; 1845).

Type collection. India, Calcutta; leg. Griffith. Lectotype: K (a sample from the herbarium Griffith without date and locality, labeled with Grantia microscopica, genus nov.).

Section Elongatae sect.nov.

Frondes parte proxima sub summa aqua natantes, parte distante inundata, cylindracea, sine cellulis pigmentiferis; stomata 0-4; frondes juveniles angulo acuto excrescantes.

Type species. W. elongata Landolt

27. Wolffia elongata Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 27; 1980)

Type collection. Columbia, Dept. Atlantico, Barranquilla; leg. G. Guiterrez and F.E. Barkley No. 18 C 006, 8.1.1948. Holotype: COL. Isotypes: S, US.

Section Pigmentatae sect.nov.

Frondes summa aqua natantes, cum cellulis pigmentiferis, stomata multa.

Type species. W. brasiliensis Wedd.

28. Wolffia brasiliensis Weddell (Ann.Sci.Nat. III, **12**, 170; 1849)

Wolffia punctata Griseb. (Fl.Br.W.Ind., 512; 1864) (STU)
Grantia brasiliensis MacMill. (Metasp.Minn., 134; 1892)
Wolffia papulifera Thompson (Rep.Mo.Bot.Gard. **9**, 40; 1898) (DS, KANU, MO)

Type collection. Brazil, Mato Grosso; leg. M.H.A. Weddell, July 1845. Lectotype: STU. Isotypes: K, L, MO.

29. **Wolffia borealis** (Engelm. ex Hegelm. 1868) Landolt (in LANDOLT and WILDI, Ber.Geobot.Inst.ETH, Stiftung Rübel **44**, 137; 1977)

Wolffia brasiliensis var. borealis Engelm. (in Hegelm. Lemnaceen, 127; 1868)
Wolffia punctata auct.am.bor. nec Griseb.

Type collection. Illinois, between Springfield and Athens; leg. E. Hall ex herb. Engelmann, September 1867. Lectotype: STU. Isotypes: DS, F, G, GH, H, KANU, L, MIN, MO.
The name W. punctata which is used by many Northamerican authors for W. borealis is a synonym of W. brasiliensis. The type collection of W. punctata from Jamaica (Wullschlaegel: STU) has been examined and identified with W. brasiliensis.

Section Wolffia

Type species. W. arrhiza (L.) Horkel

30. **Wolffia australiana** (Bentham) den Hartog and van der Plas (Blumea **20**, 151; 1972)

Wolffia arrhiza var. australiana Bentham (Fl.Austr, **7**, 162; 1878)

Type collection. Victoria, Mount Emu Creek; leg. F.v.Müller, 25.2. 1874. Lectotype: K (DEN HARTOG and VAN DER PLAS 1972). Isotypes: BRI, FI, MEL, STU.

31. **Wolffia angusta** Landolt (Veröff.Geobot.Inst.ETH, Stiftung Rübel, **70**, 29; 1980)

Type collection. Australia , New South Wales, NE of Newcastle, ca. 8 km W of Seaham; leg. B.G. Briggs and L.S. Johnson, 15.3.1970. ETH collection number 7274. Holotype: ZT. Isotype: NSW.

32. **Wolffia arrhiza** (L.) Horkel ex Wimmer (Fl.Schles. ed. 3, 140; 1857)

Lemna arrhiza L. (Mant. **2**, 294; 1771)
Lenticula arrhiza Lamk. (Fl.Fr. **2**, 190; 1778)
Wolffia Michelii Schleid. (Beitr.Bot. 233, 1844)
Wolffia Delilii Miq. (Nederl.Kruidk.Arch. **3**, 428; 1855)
Bruniera vivipara Franch. (Billotia **1**, 25; 1864)
Telmatophace arrhiza Schur (Enum.Pl.Transs., 635; 1866)

Horkelia arrhiza Druce (Fl.Berks., 511; 1898)

Type collection. Not known, there is no sample of Wolffia arrhiza in the Linnaean herbaria of London, Stockholm and Helsinki. The description must have been taken from European material; the identity is unmistakable.

33. **Wolffia columbiana** Karsten (Bot.Unters. **1**, 103; 1865)

Grantia columbiana MacMill. (Metasp.Minn., 135; 1892)
Bruniera columbiana Nieuwland (Amer.Midl.Natur. **2**, 306; 1912)

Type collection. Columbia, Santa Marta; leg. H. Karsten. Lectotype: STU.

34. **Wolffia globosa** (Roxburgh) Den Hartog and van der Plas (Blumea **18**, 367; 1970)

Lemna globosa Roxburgh (Fl.Ind. **3**, 565; 1832)
Grantia globosa Griff. ex Voigt (Hort.Suburb.Calc., 692; 1845)
Wolffia Schleideni Miq. (Nederl.Kruitk.Arch. **3**, 428; 1855)
Wolffia Delilii var. Schleideni Kurz (J.Linn.Soc.Bot. **9**, 265; 1866) (MEL)
Wolffia cylindracea Hegelm. (Lemnaceen, 123; 1868) (BM, STU)

Type collection. Not known. Unfortunately I could not get material collected by Roxburgh either from the herb. BR (LAWALREE in lit.) or from the herb. CAL where plants from Roxburgh are present. In India, there are four species of Wolffia: W. microscopica, W. globosa, W. angusta and W. arrhiza. W. microscopica does not fit the name nor the description. W. arrhiza is only known from Kashmir (few recent collections). It is not very probable that Roxburgh had specimens from there. W. angusta is represented in a herbarium sample from Calcutta. It has been recently found in Sri Lanka and Karachi. However, the species is not "globose". On the other hand, W. globosa in the present circumscription is very common in India. Therefore, it is very likely that Roxburgh had this species under investigation. HEGELMAIER (1868) described a Wolffia species (W. cylindracea) from Angola, which was considered synonymous to W. globosa by DEN HARTOG and VAN DER PLAS (1970). Earlier (LANDOLT and WILDI 1977), I doubted the identity of the two names because HEGELMAIER attributed many stomata to his species. After examination of the type collection of W. cylindracea from the herbarium Hegelmaier (STU), I agree with DEN HARTOG and VAN DER PLAS.

8.2. LIST OF NAMES AND SYNONYMS

In this section, a list of names referring to the genera and species of the family of Lemnaceae has been compiled. I attempted to identify each name I found in literature or on labels of herbarium specimens. It was usually possible to trace the type collection or at least some material which had been confirmed by the author indicated. In these cases, two asterisks have been placed behind that author's name. Where the type collections were not discovered, the identity has been taken either from the literature (e.g. DEN HARTOG and VAN DER PLAS 1970) or, if possible, assumed from the morphological description and the geographical information given by the author. One asterisk before the name indicates that the name was not validly published. Names in **fat letters** are regarded as the nomenclaturally correct names for the taxa recognized in this publication.

* not validly published
** type collection or original samples have been checked by the present author

Bruniera Franch. 1864 = Wolffia
Bruniera columbiana Nieuwland 1912 = Wolffia columbiana
Bruniera punctata Nieuwland 1912 = Wolffia brasiliensis
Bruniera vivipara Franch. 1864 = Wolffia arrhiza
Grantia Griff. ex Voigt 1845 = Wolffia
Grantia brasiliensis MacMiller 1892 = Wolffia brasiliensis
Grantia columbiana MacMiller 1892 = Wolffia columbiana
Grantia globosa Griff. ex Voigt 1845 = Wolffia globosa
Grantia microscopica Griff. ex Voigt 1845= Wolffia microscopica
*Hederula aquatica Lobelius 1579 = Lemna trisulca
Horkelia Reichenbach ex Barth. 1830 = Wolffia
Horkelia arrhiza Druce 1898 = Wolffia arrhiza
Hydrophace Haller 1768 = Lemna
Hydrophace minor Bubani 1901 = Lemna minor
Hydrophace monorrhiza Haller ex Scopoli 1772 = Lemna minor
Hydrophace perpusilla Lunell 1915 =Lemna perpusilla
Hydrophace trisulca Bubani 1897 = Lemna trisulca
Lemna Linné 1753
*Lemna abbreviata Reineck in herb. (LY)** = Lemna minuscula
*Lemna aequilatera Hegelmaier in herb. (STU)** = Lemna valdiviana
Lemna aequinoctialis Welwitsch 1859**
Lemna angolensis Welw. ex Hegelmaier 1865** = Lemna aequinoctialis
Lemna aoukikusa Beppu and Murata 1985** = Lemna aequinoctialis
Lemna aoukikusa spp. hokurikuensis Beppu and Murata 1985** = Lemna aequinoctialis
Lemna arrhiza Linné 1771 = Wolffia arrhiza
Lemna arrhiza Willd. in herb. = Wolffia hyalina

*Lemna arrhiza Mich. ex Schleiden 1839 = Wolffia arrhiza
*Lemna banatica Waldstein and Kitaibel ex Schleiden 1839 = Spirodela polyrrhiza
*Lemna biovulata Hegelmaier in herb. (STU)** = Lemna disperma
Lemna bisulca C.A. Meyer 1854 = Lemna trisulca
Lemna Blatteri McCann 1942 = Lemna aequinoctialis and Lemna minor
*Lemna cherokensis Schweinitz ex Hegelmaier 1895 = Lemna valdiviana
Lemna conjugata Willd. ex Schleiden 1839 = Lemna minor
Lemna cordata Sessé and Moc. 1890 = Lemna gibba
Lemna cruciata Roxburgh 1832 = Lemna trisulca
*Lemna cyclostasa Elliot ex Schleiden 1839 = Lemna minor
Lemna cyclostasa Thompson 1898 = Lemna valdiviana
Lemna dimidiata Rafin. 1817 = Ricciocarpus natans (L.) Corda
Lemna disperma Hegelmaier 1871**
*Lemna disperma ssp. vel var. fallax Hegelmaier 1895** = Lemna disperma
Lemna ecuadoriensis Landolt 1980**
Lemna Eleanorae McCann 1942 = Lemna aequinoctialis
*Lemna elyptica Opiz in herb. (BR)** = Lemna minor
Lemna gibba Linné 1753
*Lemna gibba Blanco 1837 = Spirodela punctata
*Lemna gibba var. americana Austin in Herb. (STU)** = Lemna obscura
*Lemna gibboides Landolt in lit.** = Lemna obscura
Lemna globosa Roxburgh 1832 = Wolffia globosa
Lemna hyalina Delile 1813** = Wolffiella hyalina
Lemna intermedia Ruthe 1827 = Lemna trisulca (teste Schleiden)
Lemna japonica Landolt 1980**
*Lemna javanica Bauer ex Hegelmaier 1868** = Spirodela punctata
*Lemna macrorrhiza Pers. in herb. (MO)** = Lemna minor
*Lemna major C.A.Mey. 1831 = Spirodela polyrrhiza
Lemna major Griff. 1851 = Spirodela polyrrhiza
Lemna maxima Blatter and Hallb. 1921 = Spirodela polyrrhiza
Lemna melanorrhiza F.v.M. ex Kurz 1867** = Spirodela punctata
*Lemna membranacea Hegelmaier in herb. (STU)** = Lemna valdiviana
Lemna minima Thuill. ex Beauv. 1816** = Lemna minor
*Lemna microscopica Schur 1866 = Wolffia arrhiza
*Lemna minima Chev. ex Schleiden 1839 = Lemna minor
*Lemna minima Kunth 1841 = Lemna minor
*Lemna minima Philippi 1857** = Lemna minuscula
*Lemna minima Humb. ex Philippi 1865** = Lemna minuscula
Lemna minima Philippi ex Hegelmaier 1895** = Lemna minuscula
Lemna minima Blatter and Hallb. 1921 = Lemna aequinoctialis
Lemna minor Linné 1753**
*Lemna minor Griffith 1851 et auct.mult. = Lemna aequinoctialis
*Lemna minor I in Landolt 1957** = Lemna turionifera
*Lemna minor II in Landolt 1957** = Lemna minor
Lemna minor var. colorata Hegelmaier 1868** = Lemna minor p.p., Lemna obscura p.p., Lemna turionifera p.p.
Lemna minor var. cyclostasa Elliot 1824 = Lemna valdiviana
*Lemna minor var. Gunnii Hegelmaier 1895** = Lemna disperma
Lemna minor var. latiuscula Domin = Lemna minor
Lemna minor var. minima Chev. 1827 = Lemna minor
Lemna minor var. obscura Austin in A. Gray 1867** = Lemna obscura
Lemna minor var. orbiculata Austin in A. Gray 1867** = Lemna obscura
Lemna minor var. oxymitra Hegelm. 1868** = Lemna minor p.p., Lemna turionifera p.p.
Lemna minuscula Herter 1954**

*Lemna minuta Rafinesque 1808 = Lemna valdiviana?
Lemna minuta H., B. and K. 1816 = Lemna minuscula?, Lemna valdiviana?, Lemna aequinoctialis?
*Lemna minuta (= Lemma minuta Desr.) Steudel 1823 = Marsilea minuta L.
*Lemna minuta Kunth ex Schleiden 1839 = Lemna minor
*Lemna monandra Wight in herb. (LE)** = Lemna aequinoctialis
*Lemna monorrhiza Montand ex Daubs 1965 = Lemna minor
*Lemna montevidensis Phil. in herb. (LY)** = Spirodela intermedia
*Lemna obliqua Sutter in herb. (MO)** = Lemna aequinoctialis
*Lemna obcordata Vahl 1791 = Ricciocarpus natans (L.) Corda
Lemna obcordata Beauvois 1816** = Spirodela polyrrhiza
*Lemna obcordata Wallich 1828 = Marchantiaceae
*Lemna obcordata Bojer 1837 = Lemna aequinoctialis
Lemna oblonga Philippi 1857** = Wolffiella oblonga
Lemna obscura (Austin) Daubs 1965**
Lemna oligorrhiza Kurz 1866** = Spirodela punctata
*Lemna orbicularis Kitaibel ex Schultes 1814 = Spirodela polyrrhiza
*Lemna orbiculata Roxburgh 1832 = Spirodela polyrrhiza
*Lemna ovata A.Braun ex Krauss 1845** = Lemna minor
*Lemna paludicola Kiener 1941** = Lemna minuscula
*Lemna palustris Haenke ex Mertens and Koch 1823 = Lemna minor
Lemna Parodiana Giardelli 1937** = Lemna gibba
Lemna paucicostata Hegelmaier 1868** = Lemna aequinoctialis
Lemna paucicostata var. membranacea Hegelmaier 1868** = Lemna aequinoctialis
*Lemna paucicostata var. subsymetrica Hegelmaier in herb. (STU)** = Lemna aequinoctialis
Lemna penicillata Lesq. 1878 (fossil) = no Lemnaceae (?)
Lemna perpusilla Torrey 1843**
*Lemna perpusilla auct. = Lemna aequinoctialis p.p.
*Lemna perpusilla var. paucicostata Hegelm. in lit. = Lemna aequinoctialis
*Lemna perpusilla var. subsolida Austin in herb. (STU)** = Lemna obscura
Lemna perpusilla var. trinervis Austin 1867** = Lemna perpusilla
*Lemna platyclados Hegelm. ex Thompson 1898** = Lemna valdiviana
Lemna pleiorrhiza F.v.M. ex Kurz 1867** = Spirodela punctata
Lemna polyrhiza Linné 1753 = Spirodela polyrrhiza
Lemna polyrrhiza var. concolor Kurz 1867** = Spirodela polyrrhiza
*Lemna polyrrhiza var. maxima Grisebach 1879** = Spirodela intermedia
Lemna punctata G.F.W. Meyer 1818 = Spirodela punctata
Lemna pusilla Hegelmaier ex Daubs 1965 = Spirodela punctata
Lemna quadrifolia Steudel 1823 = Marsilea quadrifolia L.
*Lemna reticulata Philippi fil. in herb. (BR,STU)** = Lemna minuscula
*Lemna revoluta L.A. Richard in herb. (STU)** = Wolffiella Welwitschii
Lemna rwandensis de Sloover 1973** = Lemna minor
Lemna scutata Dawson 1875 (fossil) = Nelumbo sp.(?),Hydromystria sp.(?)
*Lemna symmeter G. Giuga 1973 = Lemna gibba or Lemna gibba x Lemna minor
Lemna tenera Kurz 1871**
Lemna tertiaria Dorofeev 1963 (fossil) = near Lemna gibba
Lemna thermalis Beauvois 1816** = Spirodela polyrrhiza
Lemna Torreyi Austin 1867** = Lemna valdiviana
*Lemna transsilvanica Schur 1866 = Spirodela polyrrhiza
*Lemna trichorrhiza Thuiller (in herb. G) ex Schleiden 1839** = Lemna minor (not Lemna gibba)
Lemna trinervis Small 1903** = Lemna aequinoctialis
*Lemna trinervis auct. = Lemna aequinoctialis p.p., Lemna perpusilla p.p.

Lemna trisulca Linné 1753**
Lemna trisulca var. linearis A. and G. 1902/04 = Lemna trisulca
Lemna trisulca var. pigmaea P. Hennings 1891 = Lemna trisulca
Lemna turionifera Landolt 1975**
*Lemna umbonata A.Braun in lit. ex Hegelmaier 1868** = Spirodela polyrrhiza
Lemna valdesiana S.Watson 1871 = Lemna valdiviana
Lemna valdiviana Philippi 1864**
Lemna valdiviana var. abbreviata Hegelmaier 1878** = Lemna minuscula
*Lemna valdiviana f. gigantea Hegelmaier in herb. (STU)** = Lemna valdiviana
Lemna valdiviana var. minima Hegelmaier 1868** = Lemna minuscula
Lemna valdiviana var. pellucida Hegelmaier 1868** = Lemna valdiviana
Lemna valdiviana var. platyclados Hegelmaier 1878** = Lemna valdiviana
Lemna valdiviana var. robusta Hegelmaier 1895** = Lemna valdiviana
Lemna vulgaris Lamarck 1778 = Lemna minor (α) and Lemna gibba (β)
Lenticula Hill 1757 = Lemna
*Lenticula Boehmer 1760 = Lemna
*Lenticula aquatica Brunfels 1530 = Lemna minor
*Lenticula aquatica trisulca Bauhin 1623 = Lemna trisulca
*Lenticula aquatica trisulca Hill 1757 = Lemna trisulca
*Lenticula cruciata Roxb. ex Miq. 1855 = Lemna trisulca
*Lenticula cyclostasa Elliot ex Kurz 1866 = Lemna minor
*Lenticula gibba Lamk. 1778 = Lemna gibba
Lenticula gibba Moench 1794 = Lemna gibba
Lenticula gibbosa Renault 1804 = Lemna gibba
*Lenticula major Hill 1757 = Spirodela polyrrhiza
*Lenticula minima Humb. et Kunth ex Miq. 1855 = Lemna minor
Lenticula minor Scop. 1772 = Lemna minor
*Lenticula palustris H.Bock 1539 = Lemna minor
*Lenticula palustris Garsault 1764 = Lemna minor
Lenticula polyrrhiza Lamarck 1778 = Spirodela polyrrhiza
Lenticula ramosa Lamarck 1778 = Lemna trisulca
Lenticula trisulca Scop. 1772 = Lemna trisulca
*Lenticula vulgaris Hill 1757 = Lemna minor
Lenticularia Séguier 1754 = Lemna
Lenticularia monorhiza Montandon 1868 = Lemna minor
Pseudowolffia den Hartog and van der Plas 1970 = Wolffiella
Pseudowolffia hyalina den Hartog and van der Plas 1970 = Wolffiella hyalina
Pseudowolffia Monodii den Hartog and van der Plas 1970 = Wolffiella hyalina
Pseudowolffia repanda den Hartog and van der Plas 1970 = Wolffiella repanda
Speirodela Wats. 1880 = Spirodela
Spirodela Schleiden 1839
Spirodela atropurpurea Montandon 1868 = Spirodela polyrrhiza
Spirodela biperforata W.Koch 1933** = Spirodela intermedia
Spirodela javanica (Bauer) Hegelmaier 1895** = Spirodela punctata
Spirodela intermedia W.Koch 1932**
Spirodela magna MacGinitie 1974 (fossil) = Hydromystria sp. (?)
Spirodela maxima McCann 1942 = Spirodela polyrrhiza
Spirodela melanorrhiza Hegelmaier 1895** = Spirodela punctata
Spirodela oligorrhiza Hegelmaier 1868** = Spirodela punctata
Spirodela oligorrhiza var. javanica Hegelmaier 1868** = Spirodela punctata

Spirodela oligorrhiza var. melanorrhiza Hegelmaier 1868** = Spirodela punctata
Spirodela oligorrhiza var. pleiorrhiza Hegelmaier 1868** = Spirodela punctata
Spirodela penicillata (Lesq.) Cockerell (fossil) = no Lemnaceae (?)
Spirodela polyrrhiza (L.) Schleiden 1839
Spirodela polyrrhiza var. parva A. et Gr. 1904 = Spirodela polyrrhiza
Spirodela polyrrhiza var. magna Buchenau in A. et Gr. 1904 = Spirodela polyrrhiza
Spirodela polyrrhiza var. Masonii Daubs 1965** = Spirodela polyrrhiza
Spirodela punctata (G.F.W.Meyer) Thompson 1898**
Spirodela pusilla Hegelmaier 1895** = Spirodela punctata
Spirodela scutata (Dawson) Lesq. 1878 (fossil) = Nelumbo sp.(?), Hydromystria sp.(?)
*Spirodela Seemannii Hegelm. in herb. (STU)** = Spirodela punctata
*Staurogeton Fourr. 1869 = Lemna sect. Hydrophylla
*Staurogeton Reichenbach (1828) = Lemna sect. Hydrophylla
Staurogeton trisulcum Montandon 1868 = Lemna trisulca
Staurogeton trisulcus Schur 1866 = Lemna trisulca
Thelmatophace Schleiden 1839 = Lemna
Thelmatophace arrhiza Schur 1866 = Wolffia arrhiza
*Thelmatophace cylindracea Welw. ex Hegelmaier 1868** = Wolffia globosa
*Thelmatophace generalis E.H.L. Krause in Sturm 1906 = Lemna gibba
Thelmatophace gibba Schleiden 1839 = Lemna gibba
Thelmatophace gibbosa Montandon 1868 = Lemna gibba
Thelmatophace orbicularis Schur 1866 = Spirodela polyrrhiza
Thelmatophace polyrrhiza Godron 1843 = Spirodela polyrrhiza
Wolffia Horkel ex Schleiden 1844 (non 1839)
Wolffia angusta Landolt 1980**
Wolffia arrhiza (L.) Horkel ex Wimmer 1857
Wolffia arrhiza var. australiana Bentham 1878** = Wolffia australiana
Wolffia australiana (Benth.) den Hartog and van der Plas 1972**
Wolffia borealis (Engelm.) Landolt ex Landolt et Wildi 1977**
Wolffia brasiliensis Weddel 1849**
Wolffia brasiliensis var. borealis Engelm. ex Hegelmaier 1868** = Wolffia borealis
Wolffia columbiana Karsten 1865**
Wolffia conguensis Welw. ex Trimen 1866** = Wolffiella Welwitschii
Wolffia cylindracea Hegelmaier 1868** = Wolffia globosa
Wolffia Delilii Schleiden 1839** = Wolffiella hyalina
Wolffia Delilii Miquel 1855 = Wolffia arrhiza
Wolffia Delilii Kurz 1866** = Wolffia globosa
Wolffia Delilii var. Schleideni Kurz 1866** = Wolffia globosa
Wolffia denticulata Hegelmaier 1868** = Wolffiella denticulata
Wolffia elongata Landolt 1980**
*Wolffia floridana J.D. Smith ex Hegelmaier 1895** = Wolffiella gladiata
Wolffia gladiata Hegelmaier 1868** = Wolffiella gladiata
Wolffia gladiata var. floridana J.D.Smith 1880** = Wolffiella gladiata
*Wolffia gladiata var. abbreviata Kurtz 1891 in herb. (CORD)** = Wolffiella oblonga
Wolffia globosa (Roxb.) den Hartog and van der Plas 1970
*Wolffia Hegelmaieri F.v. Mueller in herb. (STU)** = Wolffia australiana
Wolffia hyalina Hegelmaier 1868** = Wolffiella hyalina
Wolffia lingulata Hegelmaier 1868** = Wolffiella lingulata
Wolffia lingulata var. minor Hegelmaier 1878** = Wolffiella oblonga (and Wolffiella lingulata)

Wolffia Michelii Schleiden 1844 = Wolffia arrhiza
Wolffia microscopica (Griff.) Kurz 1867**
*Wolffia oxyphylla Spegazzini in herb. (INTA)** = Wolffiella oblonga
Wolffia oblonga Hegelmaier 1868** = Wolffiella oblonga
Wolffia papulifera Thompson 1898** = Wolffia brasiliensis
Wolffia punctata Grisebach 1864** = Wolffia brasiliensis
*Wolffia punctata auct. amer. = Wolffia borealis
Wolffia repanda Hegelmaier 1865** = Wolffiella repanda
*Wolffia Robbinsii Austin in herb. (PH)** = Wolffia columbiana
Wolffia Schleideni Miquel 1855 = Wolffia globosa
*Wolffia veseiculosa Austin in herb. (STU)** = Wolffia columbiana
Wolffia Welwitschii Hegelmaier 1865** = Wolffiella Welwitschii
Wolffiella Hegelmaier 1895
Wolffiella denticulata (Hegelm.) Hegelmaier 1895**
Wolffiella floridana (J.D.Smith) Thompson 1898** = Wolffiella gladiata
Wolffiella gladiata (Hegelm.) Hegelmaier 1895**
Wolffiella hyalina (Delile) Monod 1949**
*Wolffiella Kurtzii Thompson in herb. (KANU)** = Wolffiella oblonga
Wolffiella lingulata (Hegelm.) Hegelmaier 1895**
Wolffiella Monodii Jovet-Ast 1968** = Wolffiella hyalina
Wolffiella neotropica Landolt 1980**
Wolffiella oblonga (Phil.) Hegelmaier 1895**
Wolffiella repanda (Hegelm.) Monod 1949**
Wolffiella rotunda Landolt 1980**
Wolffiella Welwitschii (Hegelm.) Monod 1949**
Wolffiopsis den Hartog and van der Plas 1970 = Wolffiella
Wolffiopsis Welwitschii den Hartog and van der Plas 1970 = Wolffiella Welwitschii
Wolfia Kunth 1841 (non Endl. 1837) = Wolffia