Ditremis Clem. sensu Harris (1990)

(Syn.: Anisomeridium)

After Harris (Dissertation, as Anisomeridium)
and Harris, 1990 (as Ditremis)

Rev. 5/94

Thallus immersed, whitish or pale gray; Trentepohlia always present.

Perithecia hemisphercial to globose, simple to compound; wall composed of ± cellular hyphae without bark cells, thicker in upper part, often with well differentiated involucrellum, brownblack above, pale brown to ± colorless below; pigment K+ greenish. Hamathecium of slender, branched and anastomosed, longcelled pseudoparaphyses ca. 1 um thick; periphyses absent; gel I. Asci cylindricclavate, K/I; fissitunicate, the apical dome with indistinct or short and broad ocular chamber, 8spored (sometimes a few spores aborting); spores clavatefusiform to ovate, 1(3)septate, most commonly with one half of the spore shorter and/or narrower than the other, if oval then not ornamented and uniseriate; often biseriate or irregularly arranged in the ascus; first formed septum often towards lower end of spore; colorless, smooth, without distinct perispore.

Pycnidia immersed to sessile, ± globose or conical, black; conidiogenous cells cylindrical, enteroblastic, with collarettes, often percurrently proliferating; micro and macroconidia (produced in separate pycnidia) globose to elliptical, ovoid, or bacilliform. No substances. On bark or less often rock. Temperate to tropical.

I. Growing on rock.

1. Spores becoming 4celled, 1622 x 6.58 um. Thallus epilithic, whitish to brownish, thin. Ascocarps subglobose, 0.10.3 mm diam. Asci narrowly elliptical or narrowly obovate, ca. 7080 x 1518 um; spores irregularly arranged, narrowly ovate to narrowly elliptical, not constricted at the septa. Microcniida narrowly elliptical, 45 x 1.52 um. Macroconidia elliptical, 55.5 x 2.53 um. On moist rocks but apparently not aquatic. Massachusetts; Ohio. ..... D. distans (Willey) R. C. Harris (syn. Anisomeridium distans)

1. Spores remaining 2celled. 2

2. Spores (11)1318 x 5.57 um. More or less aquatic, on noncalcareous rock; northeastern U. S. Thallus epilithic, whitish, greenish or tan; black hypothallus not evident in some specimens, to dominant in others. Ascocarps hemispherical to subglobose, semiimmersed, 0.20.3 mm diam. Asci narrowly elliptical to narrowly obovate, 5060 x 1317 um; ascus wall thickened at tip. Spores irregularly arranged, ovate to almost elliptical. Microconidia narrowlyelliptical, 45 x 1.52 um. Along streams, probably occasionally inundated. Connecticut; Michigan. ..... D. carinthiaca (Steiner) R. C. Harris (syn. Anisomeridium carinthiacum)

2. Spores 2025 x 6.68.5 um. Not aquatic; on limestone. Southern Florida and West Indies. Thallus endolithic, whitish. Ascomata emrgent (immersed in Puerto Rico specimens), subglobose or with upper part of wall extended outward to form a clypeus, wall thinner below. Paraphyses branched and anstomosed, embedded in abundant hymenial gelatin. Asci cylindrical, 105125 x 1518 um, thickened at tip, with small ocular chamber. Spores subiseriate, narrowly ovate, lower cell usually shorter, wall smooth. Microconidia elliptical, 35 x 11.5 um. Macroconidia not known. ..... D. finkii R. Harris (syn. Anisomeridium finkii R. C. Harris ined.)

II. Growing on bark or wood.

1. Thallus UV+ yellow (lichexanthone) or rarely UV in D. ambigua). 2
1. Thallus UV. 5

2. Spores small, under 20 um long. 3
2. Spores larger, over 25 um long; macroconidia orbicular to elliptical. 4

3. Spores with tapered ends, (12)1520 x 56.5 um; macroconidia cylindrical, 7.512 x 22.5 um, occasionally 2celled. Thallus gray or whitish. Ascocarps mostly immersed, hemispherical, 0.50.6 mm diam., wall often forming a shield, lacking below. Asci cylindrical, 90115 x 1012 um. Spores uniseriate to subbiseriate, narrowly ovate, slightly constricted at the septum. Microconidia elliptical to suborbicular, 2.53 x 1.52 um. On various barks. Florida; Louisiana. ..... D. tuckerae (R. C. Harris) R. C. Harris (syn. Anisomeridium tuckeri [sic])
3. Spores subglobose to oblong, 1012 x 68 um; macroconidia not cylindrical. Florida. ..... D. sp. (Harris, 1990)

4. Spores 3752 x 1220 um; macroconidia elliptical, 3045 x 1520 um. Ostioles surrounded by a small ring of orange anthraquinone pigment (K+ purple). Thallus white. Asocarps mostly immersed, hemispherical to subglobose, 0.50.8 mm diam.; wall often extended to form a clupeus, thinner or lacking below; ostioles mostly excentric. Asci cylindrical, 150200 x 2030 um, with a distinct ocular chamber. Spores subbiseriate to biseriate, narrowly ovoid, often with rather pointed ends, lower cell markedly shorter, wall not ornamented. Microconidia ellipsoidal, 2.54 x 1.22 um. Southern Florida. ..... D. macrospora R. C. Harris (syn. Anisomeridium macrosporum R. C. Harris ined.]
4. Spores 2433 x (8)913 um; macroconidia suborbicular to broadly elliptical, 1521 x 1015 um. Ostioles without orange, K+ pigment. Thallus whitish or grayish. Ascocarps immersed; hymenium ovate; wall usually thick above and extending outward to form a shield (clypeus), thin or lacking below. Asci cylindrical. Spores nearly uniseriate, ovate to narrowly ovate, ends often somewhat pointed, slightly constricted at the septum, 2433 x (8)913 um. Microconidia elliptical to narrowly elliptical, 34 x 1.52 um. On soft bark of various kinds of trees. Florida ..... D. ambigua (Zahlbr.) R. C. Harris (syn. Anisomeridium ambiguum)

5. Spores soon becoming 4celled. 6

5. Spores 2celled. 7

6. Spores 1620 x 3.54.5 um. Southern (Louisiana). Thallus thin, gray. Ascomata subglobose, ca. 0.5 mm diam.,wall lacking below. Asci clavatecylindrical, ca. 7080 x 10 um. Spore biseriate, fusiform, straight to somewhat curved, smooth. Microconidia globose to ellipsoid, 2 um diam. or 2 x 1 um. Macroconidia oblong, 56 x 23 um. On bark.
Florida. ..... D. quaternaria R. C. Harris
6. Spores (12)1420(23) x (3)4.55(6) um. Mainly northern (as far south as North Carolina). Microconidia elliptical, colorless, oblong or oval, 23 x 11.5 um. Macroconidia elliposid or ovoid, 3.54.5 x 1.82 um. Thallus endophloeodal, often inconspicuous, effuse, whitish, gray or graygreen, smooth. Trentepohlia abundant, well developed. Ascocarps rarely numerous and crowded, usually absent (only abundant macropycnidia present) or scattered, black, shiny, subconical to subglobose, initially immersed but becoming superficial, 0.150.25 mm diam., 0.10.2 mm high; wall brownblack, 3050 um thick above, thinner and colorless below, or lacking below. Hymenium I. Interthecial hyphae ca. 1 um thick, septate, branched and anastomosed. Asci clavatecylindrial, not much thickened at the tip, inner surface with an indistinct indentation, 5575(90) x 1215 um. Spores biseriate, narrowly ovate to fusiform or clavatefusiform, 1septate, often (2)3septate, cells unequal, the upper broader and up to twice as long as the lower. Pycnidia black, ca. 0.1 mm diam., of two types: (a): 100150 um diam., ± sessile, conical with an ostiolar neck composed of vertically arranged, brownwalled hyphae, whtihc at the apex of the neck have free, colorless, pointed ends, with macroconidia extruded as a white cirrus 1013 um wide, in which the conidia are bound by a gelatinous matrix, or (b) 50100 um diam., ± immersed, globose, with microconidia. On rough bark of broadleafed trees, most commonly Quercus alba and Ulmus americana, but also on various other types of trees (especially Sambuscus) and on old wood (rarely also on shaded rock according to Coppins & James), in humid woodland and tall scrub, tolerang of deep shade. Throughout most of the eastern U.S. except the SE coastal plain, from Maine to Alabama, west to the Great Lakes region and Ozarks ..... D. nyssaegena (Ellis & Everh.) R. C. Harris (syn. Anisomeridium nyssaegena, A. willeyanum R. C. Harris ined.)

7. Ostiole lateral. 8
7. Ostiole apical. 10

8. Spores smooth, 3440 x 1218 um. Ascomata covered by thallus. Florida. ..... D. sp. (Harris, 1990)
8. Spores granular ornamented, 1840 x 5.512 um. Ascomata usually naked. [D. adnexum may also key out here]. 9

9. Spores 1827 x 5.57.5 um. Florida keys. ..... D. terminata (Fe) R. C. Harris
9. Spores 2737 x 7.511 um. Not yet known from N. America..... [D. americana (Massal.) R. C. Harris]

10. Spores less than 13 x 5 um or over 35 x 13 um. 11
10. Spores 1224 x 4.58.5 um. 12

11. Spores small, 913 x 45 um. Thallus whitish, endophloedal. Ascocarps hemispherical to subglobose, 0.20.3(0.4) mm diam. Asci cylindrical, occasionally slightly broader toward the base, 5075(85) um long. Spores nearly uniseriate to subbiseriate, narrowly ovate, slightly constricted at the septum, 913 x 45 um. Microconidia narrowly elliptical to rectangular, 3.54.5 x 1.22 um. On bark, usually Quercus but occasionally on Myrica. Northern and central Florida. ..... D. albiseda (Nyl.) R. C. Harris (syn. Anisomeridium albisedum)
11. Spores large, 3542 x 1317 um. Florida. ..... D. sp. (Harris, 1990)

12. Asci ovate or obovate to narrowly ovate or obovate. 13
12. Asci slender, cylindrical to narrowly clavate. 14

13. Ascus wall thick, unevenly thickened; spores 1522 x 6.58.5 um. Ascocarps hemispherical to subglobose, semiimmersed to immersed; wall sometimes extended outwards above to form a clypeus, thin or lacking below. Asci narrowly obovate or rarely narrowly elliptical, 6080 x 1320 um. Spores irregularly arranged, ovate, lower cell markedly shorter, occasionally slightly constricted at the septum, 1522 x 6.58.5 um. Microconidia in some specimens orbicular, ca. 2.5 um diam., in other specimens elliptical, ca. 3 x 1.52 um. Macroconidia elliptical, 56 x 2.53.5 um. On various barks. Florida; Tennessee. ..... D. anisoloba (Mll. Arg.) R. C. Harris s. lato (syn. Anisomeridium feeanum)
13. Ascus wall relatively thin (12 um) and even; spores 1822 x 5.57 um. Ascocarps subglobose, 0.150.2 mm diam. Asci obovate,

5063 x 1623 um. Spores irregularly arranged, narrowly ovate with rather pointed ends. Microconidia orbicular, ca. 2 um diam. On bark (Diospyros). Florida. Similar to A. leucochlorum but with broader asci and longer spores. ..... D. sanfordensis (Zahlbr.) R. C. Harris (syn. Anisomeridium sanfordense)

14. Spores broadly elliptical to ovate, rarely narrowly ovate. 15
14. Spores slender, narrowly ovate to almost cylindrical (often slightly bent in D. tamarindi); coastal plain and West Indies. 16

15. Asci dactyloid to cylindrical, 65130 x 1015 um. Spores subbiseriate to uniseriate, 1018 x 4.57.5 um. Thallus usually conspicuous, whitish or pale grayish, effuse or delimited by a thin, blackish hypothallus. Ascocarps usually numerous, hemispherical to globose, immersed or emergent (to 3/4superficial), 0.30.4(0.6) mm diam.; upper wall with usually well differentiated involucrellum (clypeus), 50100 um thick; lower wall pale or colorless. Spores narrowly obate to elliptical, sometimes slightly constricted at septum; septum 1/21/3 from upper end. Pycnida of two types: (a) 100200 um diam., with macroconidia relatively rare, orbicular to elliptical or ovate, 35 um diam. or (2.3)3.55 x (1.8)2.53 um, extruded as a white blob, (b) 40100 um diam., ± immersed, hemispherical to globose, with microconidia orbicular, (1)1.52(3) um diam. On smooth or rough bark of broadleaved trees in woodland or sheltered open situations, or on old wood. Common on both coasts, mainly temperate, rarer in the South, Maine to Florida (rarer inland to the Great Lakes area), British Columbia to S. California. A variable species; one population (mainly eastern) has spores almost always elliptical and uniseriately arranged in the ascus (as in Acrocordia, but the spore walls lack ornamentation). ..... D. biformis (Borrer) R. C. Harris s. lato (syn. Anisomeridium biforme)
15. Asci narrowly obovate, 1218 x 57.5 um. Spores irregularly arranged, 1218 x 57.5 um; macroconidia globose, often slightly tinted, 2.54 um diam. Ascus wall rather thin and uniform, ca. 1.53 um. Ascocarps often immersed, hemispherical to subglobose, wall lacking below, 0.20.3 mm diam. Spores narrowly ovate to ovate, 1218 x 57.5 um. Microconidia orbicular, 22.5 um diam. On bark. Massachusetts, Connecticut, and as far inland as southern Ohio and Illinois. ..... D. leucochlora (Mll. Arg.) R. C. Harris (syn. Anisomeridium leucochlorum)

16. Microconidia elliptical; macroconidia not known; spores

1218(21) x 4.56.5 um, not bent. Ascocarps hemispherical to subglobose, 0.30.5(0.6) mm diam., wall thinner or lacking below. Asci dactyloid to cylindrical, 75125 x 912 um. Spores uniseriate to biseriate, narrowly ovate, often with rather pointed ends, slightly constricted at septum. On bark, especially Taxodium. S. Carolina; Florida; Louisiana. ..... D. subprostans (Nyl.) R. C. Harris (syn. Anisomeridium subprostans)

16. Microconidia orbicular; macroconidia elliptical, 47 x 2.53.5 um; spores 1522(24) x 45.5(6) um, the longer ones often slightly bent. Ascocarps immersed, hemispherical, 0.40.6 mm diam., wall forming a clypeus, lacking below. Asci dactyloid to cylindrical, 75110 x 1012 um. Spores uniseriate to biseriate, narrowly ovate to ovate. On bark (often on coconut palm). Florida; Louisiana. ..... D. tamarindi (Fe) R. C. Harris (syn. Anisomeridium tamarindi)

ADD:

Asci ovate. Spores irregularly arranged, broadly ovate, 2533 x 1518 um; spore cells strongly unequal; wall strongly ornamented. Macroconidia orbicular, ca. 2 um diam. On bark. Brazil; not in N. America according to Harris, 1975....."Anisomeridium adnexum (Mll. Arg.) R. C. Harris"

Literature

Coppins, B. J. and P. W. James. 1992. Anisomeridium. In: Purvis, et al., Lichen Flora of Great Britain and Ireland.

Harris, R. C. 1973. Corticolous Pyrenolichens of the Great Lakes Region.

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