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THREE AMERICAN OSCILLATORIACEAE

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OSCILLATORIA **luteola**, sp. nov. *O. laetevirens* of Collins, RHODORA **2**: 42. 1900 (at least in part), Phyc. Bor.-Amer. **22**: 1054. 1903; of Holden in Collins, RHODORA **7**: 172. 1905; of Tilden, Minnesota Algae **1**: 78. 1910 (in part); of Collins, Proc. Portland Soc. Nat. Hist. **2**: 260. 1911; of Taylor, Marine Algae of Florida, 45. 1928; not Crouan ex Gom. *O. formosa* of Holden, Phyc. Bor.-Amer. **15**: 710. 1900, in Collins, RHODORA **7**: 172. 1905; of Tilden, idem **1**: 80. 1910; not Bory ex Gom. *Oscillatoria* sp. of Hazen in Lewis, RHODORA **26**: 215. 1924.—Stratum luteolum vel luteo-viride, tenue, haud raro fere membranaceum, fragile, variis Oscillatoriaceis vulgo immixtis submersum vel raro emersum subaerialeque; trichomatibus in vivis pulchre luteo-viridibus, rectis, raro leviter flexilibus, fragilibus, ad genicula evidenter constrictis, numquam torulosis, 3 μ ad 5 μ crassis, apice rectis raro vix curvatis uncinatisve, brevissime attenuatis; articulis subquadratis vel diametro usque triplo brevioribus, 1.5 μ ad 5.5 μ longis; protoplasmate per totam cellulam tenui-granuloso; dissepimentis conspicuis, pellucidis, haud granulatis; cellula apicali obtuse cylindrico-conica, haud capitata, sine calyptra (v. v., v. s., v. in form.). FIG. 1. In quiet brackish pools along the eastern coast of North and South America. MAINE: Harpswell, *F. S. Collins*, 12 July 1903 (Phyc. Bor.-Amer. 1054, *W*,[1] *T*, *Y*). MASSACHUSETTS: with other algae floating in Gardiner's Ditch, Woods Hole, *Drouet 1134*, 30 June 1934 (*D*, *W*), *Drouet 1909*, 10 Aug. 1936 (TYPE in Herb. Francis Drouet; ISOTYPES: *F*, *T*, *W*, *Y*); subaerial in salt marsh, Pasque Island, Gosnold,

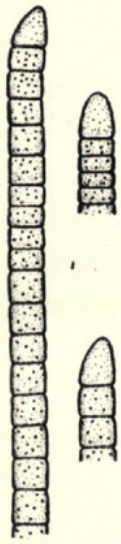

FIG. 1.

[1] Specimens are cited from herbaria by means of the abbreviations: *D* (the author's personal herbarium), *F* (Farlow Herbarium), *T* (Herbarium of Wm. Randolph Taylor), *W* (Herbarium of the Marine Biological Laboratory), *Y* (Herbarium of Yale University).

M. Ashton, 8 July 1936 (*D*); Botanical Survey of Penikese Island, Gosnold, 24 July 1923 (*W*); Penikese Island, Gosnold, *T. Hazen*, 1923 (*T*). CONNECTICUT: pool, Stratford, *I. Holden*, 27 May 1900 (Phyc. Bor.-Amer. 710, *W*, *T*, *Y*); shore of 'Fresh Pond,' Stratford, *Holden 730*, 25 Sept. 1892 (*F*), *Holden 951*, 17 June 1894 (*F*); 'Fresh Pond,' Bridgeport, *Holden 1503*, 27 May 1900 (*F*); with *O. brevis* var. *neapolitana*, Yellow Mill Bridge, Bridgeport, *Holden 948*, 10 June 1894 (*F*); Berkshire Mill Pond, Bridgeport, *Holden 42*, 22 June 1890 (*F*); brackish pool, Cook's Point, Bridgeport, *Holden 1471*, 25 June 1899 (*F*). BERMUDA: ditch in Pembroke marshes, *F. S. Collins*, 23 Aug. 1913 (sub. nom. *O. tenuis* var. *tergestina*, *F*). FLORIDA: Long Key, Dry Tortugas, *W. R. Taylor 75*, 15 June 1924 (*T*). CEARÁ: on mud of a salt marsh, Praia Formosa, Fortaleza, *Drouet 1333*, 27 July 1935 (*D*).

The trichomes lack the subacute apices characteristic of *O. laetevirens* Crouan ex Gom. as figured by Gomont (Ann. Sci. nat. VII Bot. **16**: Pl. VII, fig. 11) and by Frémy (Mém. Soc. nat. Sci. nat. & math. Cherbourg **41**: Pl. 31, fig. 12) and as seen in an authentic specimen of that species (Brest, *Crouan*) obligingly sent to me by Prof. Frémy. *O. luteola* inhabits quiet brackish water and is seldom seen in quiet salt water; *O. laetevirens* is usually collected in less quiet but strictly marine waters. The plant-mass and trichomes of the former, moreover, have a much more definitely yellow-green color than have those of the latter species. The form of the apical cell, the nature of the outer wall of the apical cell, the color, and the habitat of *O. luteola* make this species quite distinct from *O. tenuis* var. *tergestina* (Kütz.) Rabenh. ex Gom. and *O. formosa* Bory ex Gom. Other differences can be pointed out in the range in diameter of the trichomes, in the nature of the cross-walls, and in the type of granulation of the protoplasm in non-hormogonial plant masses. *O. luteola* is an often encountered alga of shallow brackish water in southern Massachusetts, commonly present in great quantity in association with *O. amphibia* Ag. ex Gom., *O. brevis* var. *neapolitana* (Kütz.) Gom., *O. margaritifera* Kütz. ex Gom., *Spirulina major* Kütz. ex Gom., *Microcoleus chthonoplastes* (Fl. dan.) Thur. ex Gom., and species of Lyngbya and Hydrocoleum. It apparently occurs in similar associations in brackish localities throughout its geographic range.

OSCILLATORIA GRANULATA Gardner,[1] Mem. New York Bot. Gard.

[1] An emended description of *O. granulata* Gardn. as seen in the type and other material cited here is offered: Stratum laete-aerugineum vel caeruleum, siccatum atroviride; trichomatibus rectis vel undulatis, saepe parallele in stratum aggregantibus, saepe inter alias algas dispersis, ad apicem sensim et longe attenuatis, truncatis, haud capitatis, ad genicula non constrictis, 3 μ ad 5 μ crassis, superne uncinatis vel spiralibus; articulis vulgo subquadratis aut diametro paullo longioribus vel brevioribus, 2 μ ad

7: 37. Pl. 8, fig. 71. 1927, New York Acad. Sci. Sci. Surv. Porto Rico **8** (2): 269. 1932; Geitler, Rabenh. Kryptogamen-Fl. **14**: 963. 1932.—In quiet fresh (rarely slightly brackish) water along the Atlantic coast of North and South America. MASSACHUSETTS: Fresh Pond, Cambridge, *W. G. Farlow*, Oct. 1879 (with and sub. nom. *O. splendida*, *F*); in a swampy area north of Nobska Point, Falmouth, *Drouet 1947*, 16 Sept. 1936 (*D*, *F*, *T*); in a bog, Pasque Island, Gosnold, *H. Croasdale*, 26 June 1934 (*D*); north shore of Pasque Island, Gosnold, *Drouet 1126A*, 26 June 1934 (*D*, *F*, *T*, *Y*); Pink Pond, Nonamesset Island, Gosnold, *H. Croasdale*, 2 July 1934 (*D*). PUERTO RICO: in a pool at the park, Santurce, *N. Wille 51 b*, 25 Dec. 1914 (TYPE in Herb. New York Botanical Garden). CEARÁ: with *O. anguina* in a pool, Barra do Ceará, Municipio de Fortaleza, *Drouet 1438*, 26 Sept. 1935 (*D*). PARAÍBA: in Açude Baixa near Campina Grande, *S. Wright 2042*, 11 Dec. 1933 (*D*).

FIG. 2.

In southern Massachusetts, this species is often collected in mixtures with other algae and seldom in relatively pure masses, and is quite common in freshwater ponds along the seashore. Gardner's type specimen in the Herbarium of the New York Botanical Garden contains rather small numbers of the trichomes described; fortunately, though the principal part of the collection has been dried from material preserved in formalin (with the trichomes somewhat distorted), a part of the material has been dried from the living condition. The original description does not adequately characterize the trichomes in this specimen. The apices are distinctly attenuated and truncate in the type material (FIG. 2) and in the other specimens cited here. The thickening of the outer membrane of the apical cell is so apparent that in material dried from formalin the upper end of the apical cell often remains distended and gives a capitate appearance to the trichome. The species seems to be most closely related to the capitate *O. amoena*.

SPIRULINA **stagnicola**, sp. nov.—Trichomata 1.5 μ ad 2.0 μ crassa, usque ad 500 μ longa, inter alias algas sparsa, in speciminibus vivis siccatisque aeruginea, flexilia, ambitu recta aut flexuosa, in spiram laxissimam regularem diametro 7.5 μ ad 11.5 μ aequantem contorta, anfractibus 1 ad 30, inter se 20 μ ad 28 μ distantibus; protoplasmate passim tenui-granuloso; apice trichomatis rotundata; pseudo-septis rufo-neutro evidentibus; pseudo-articulis subquadratis vel diametro

6 μ longis; protoplasmate laete-aerugineo, haud raro luteolo-viride vel chalybeo, tenui-granuloso; dissepimentis passim conspicuis, passim grosse-granulatis; cellula apicali truncata, membranam evidenter incrassatam praebente (v. s., v. v., v. in form.)

FIG. 3.

usque duplo longioribus (v. v., v. s., v. in form.). FIG. 3 MASSACHUSETTS: in brackish water, Nonamesset Island, Gosnold, *E. T. Rose*, 21 June 1936 (TYPE in Herb. Francis Drouet; ISOTYPES: *F*, *T*, *W*, *Y*).

This new form was found in a brackish pond in company with *Lyngbya aestuarii* (Mert.) Liebm. ex Gom. and a variety of different Chroococcales, bacteria, and protozoa. It appears to be most closely related to *S. laxissima* G. S. West (Journ. Linn. Soc. Bot. **38**: 178. 1907) and *S. laxa* G. M. Smith (Bull. Torr. Bot. Club **43**: 481. 1916), but the measurements of the trichomes of *S. stagnicola* differ widely from those of the two latter species. When unstained, the living trichomes appear unseptate; but when stained with a dilute aqueous solution of neutral red, 'septations' become evident. The 'cells' thus produced are subquadrate or longer than wide. Individuals are not abundant in the type material and only collection.

EXPLANATION OF FIGURES

FIG. 1. OSCILLATORIA LUTEOLA sp. nov., showing typical apical portions of three trichomes (drawn from the type material, × 333).

FIG. 2. O. GRANULATA Gardn., showing typical apical portions of two trichomes (the larger drawn from *Drouet 1126A*, from Massachusetts; the smaller from the type material from Puerto Rico, × 333).

FIG. 3. A trichome of SPIRULINA STAGNICOLA sp. nov., × 333.

OSBORN BOTANICAL LABORATORY OF YALE UNIVERSITY AND
DEPARTMENT OF BOTANY, MARINE BIOLOGICAL LABORATORY

SOME WESTERN LEPIDIUMS IN MICHIGAN.—On June 20 and 27, 1928, Mr. Bruno Gladewitz, of Detroit, Mich., and I took botanical outings along the M. C. railroad tracks from Ypsilanti to Dexter or nearly to that place. A number of interesting plants were found. At Ypsilanti, June 20, no. 8218, was a large coarse plant that had the general appearance of *L. virginicum* but different leaves and fruit; the pubescence is also of a different character. It proved to be *L. montanum* var. *Eastwoodiae* (Wooton) C. L. Hitchcock. A similar plant with differently shaped fruit, collected at Ann Arbor on the 27th, no. 8221, is *Lepidium montanum* var. *alyssoides* (A. Gray) M. E. Jones. These plants were collected along the railroad right of way and very evidently are wanderers from the West by way of railway freight lines, much in the same way as *Lepidium perfoliatum* L., no.

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