

- Potamogeton praelongus*, Wulf. Twin Lakes, Branford.
Scirpus debilis, Pursh. Seymour.
Eriophorum vaginatum, L. Middlebury and Litchfield.
Rhynchospora fusca, Roem. and Schultes. Woodbury.
R. macrostachya, Torr. Woodbury.
Carex retrorsa, Schwein. West bank of the Housatonic River above Derby.
C. torta, Boott. Common about Oxford, although not in the catalogues.
C. granularis, Muhl. Oxford.
C. Willdenovii, Schkuhr. East Haven.
C. sparganioides, Muhl. Oxford and Reynolds Bridge.
C. Deweyana, Schwein. Reynolds Bridge.
Tripsacum dactyloides, L. East Haven.
Triodia cuprea, Jacq. Common along the Housatonic.
Eragrostis Frankii, Meyer. Common in sandy soil along the Housatonic at Oxford.
E. Purshii, Schrader. Oxford.
Pellaea atropurpurea, Link. Twin Lakes, Branford.
Woodwardia angustifolia, Smith. Three stations in Oxford.
Phegopteris Dryopteris, Fée. Monroe.
Cystopteris bulbifera, Bernh. Oxford.

NAUCORIA CHRISTINAE.

H. WEBSTER.

WHILE visiting a familiar collecting ground along the northern edge of the Blue Hill Reservation, a few years ago, the writer came upon a small but conspicuous toadstool, fruiting in the loose soil formed of decaying chestnut leaves and burs. Its dark red color and sharply-pointed cap, together with its smooth and somewhat shining surface, gave it a markedly individual character, which became more strongly accentuated on further acquaintance. For, in addition to the striking peculiarities of color and shape, an attempt to collect the plant, which stood an inch or two high, disclosed a long stem, as in *Collybia radicata*, sunk in the leaf-mould to such a depth that several inches of soil had to be removed before a complete specimen could be obtained. The difficulty of collection was much increased, also,

by the extreme fragility of the stem, which, in spite of its comparatively large size, and evidently "cartilaginous" exterior, broke frequently of its own weight as soon as the upper portion was freed from its supports.

Examination showed the plant to be a *Naucoria*, closely related to the four Friesian species *N. lugubris*, *N. festiva*, *N. Christinae*, and *N. hilaris*, of which Fries observes (*Hymenomycetes Europaei*, p. 254,) that they form a remarkably distinct natural group. Dr. Farlow, to whom the fungus was submitted for determination, referred it to *N. Christinae*, with the information that it had not before been recorded for this country.

On account of some discrepancies between the plants found and the diagnosis as given by Fries, most of which, however, can probably be reconciled, the description and the main part of the remarks given in his *Icones* (vol. II., p. 20) are translated here in order that they may be compared with notes from fresh plants:

"**AGARICUS CHRISTINAE.**—Pileus fleshy, thin, acutely conical, viscous, when moist bright cinnamon, when dry tawny, shining, growing pale; stipe fistulose, tough, deeply rooted, glabrous, dull blood-red; lamellae free, close, pallid, then bright saffron yellow.

"A most splendid fungus, with somewhat the stature of *Hygrophorus conicus*. Veil none. Stipe remarkably cartilaginous, very tough, unicolorous or paler above, at length bay, 3 to 4 inches long, 1 to 2 lines thick. Commonly with 4 to 6 elevated ridges radiating from the umbo; in wet weather sometimes strongly viscid, sometimes only moist, margin at first cracked, somewhat repand as if lobed; color varies blood-red, cinnamon, and rusty-red. Flesh thin, concolorous. Lamellae, free or slightly adnexed, receding, bare (not pulverulent), somewhat spotted. Spores ferruginous."

Though young specimens are acutely conical for a long time, the mature form is very broadly conical, with a sharp umbo; the surface is smooth, but marked (under a hand lens) with fine, close lines, which radiate from the apex of the umbo; the pileus is somewhat hygrophanous, the margin faintly striate when moist, and becoming revolute with age; the crowded lamellae appear to be free, but are always slightly adnexed, with an average breadth 2 to 3 times the thickness of the cap; their color varies from pale yellow to dark ferruginous; the stem is very fragile, but on wilting becomes tough, as described by Fries; it turns black on drying, as does the whole plant. The radicating portion is three or four times as long as the part above

ground; radiating ridges appear on the pileus in process of drying, and indeed it would almost seem as if some of the characteristics given by Fries, noticeably the toughness, the ridges, and the darker tints, had been drawn from plants that had partially dried either before or after collection. At any rate it has taken partly dry material to show the characteristics just noted.

The spores are somewhat pip-shaped, more strongly pointed at one end, and somewhat flatter on one side; size 10 to 11 x 5 μ . This agrees well with Quelet's "spores amygdaloid, 10 to 12 μ long," as quoted by Saccardo.

Saccardo, on what authority does not appear, gives the spores as being 4 to 5 by 3 to 4 μ , dimensions which accord with those of the spores of *Naucoria Jennyae* Karsten, as described in *Hedwigia*, 1881, p. 178, a species, from its description and the author's note, evidently very close to *N. Christinae*, but said to be larger, and with lighter-colored, ovoid spores.

Fries's figure (*Icones*, t. 121, f. 2) agrees fairly well.

After the first collection in 1896, the plant was found in the same year in damp, mixed woods south of Houghton's Pond, in the Reservation; in 1898, August, in the original station, also in Weston, Mass., in October, on the low river bank, under chestnuts and maples, and in Melrose, Mass., under oaks on a hillside. It has also been found in the Middlesex Fells, in Lynn woods, near Worcester (Dr. G. E. Francis), near Gilead, Maine (Miss Kate Furbish), and at Centre Ossipee, N. H. (F. O. Grover). Specimens of most of these collections are in the herbarium of the Boston Mycological Club.

It is most abundant in the Melrose station, where it was found in troops of several feet in extent, and in smaller groups, but not at all caespitose. The button stages have to be sought an inch or two below the surface, for they seem to arise from the lower layers of the humus, whence the base descends sometimes into the sandy soil below, and the stipe forces the pointed pileus up through the overlying leaf-mould to the surface. In places where the ground was covered with oak leaves, the stipes were longer, firmer, and flexuous, apparently having been forced by the non-resistant nature of the loose leaves to wind about in search of an opening through which they could reach light and air. At any rate, wherever the leaves were moist and firmly packed, holes were punched clean through by the straight upward thrust of the sharp-pointed buttons.

As the stem is very apt to decay an inch or so from its base, and thus increase its natural fragility, the difficulty of collection is great, and calculated to try the patience of any one who may happen upon this interesting fungus at the end of a day's trip, and try to get good herbarium specimens of it in his last ten minutes of disposable time.

SEAWEEEDS IN WINTER.

F. S. COLLINS.

THE greater part of the collecting of algae, as well as of higher plants, is done in the summer months, or at most in the period between the spring and autumn equinoxes, and it will probably surprise those who have not already investigated for themselves, to know that the life and growth along the shore are continuous. On land the lichenologist can always find employment, and the bryologist may find fruiting mosses during the winter months, but of other land plants one finds only the memory of the past or the hope of the future.

But not much below high-water mark the condition changes, and at low-water mark winter seems to have no influence whatever. On the first day of January last, I was at a point on the shore of Long Island Sound; the day was intensely cold, the thermometer hardly above zero. As the tide receded, a film of ice almost immediately covered the rocks and the fuci growing on them; every pool was covered with ice, but on breaking this coating, algae, red, brown and green, were growing in perfection, even the most delicate, filmy *Ectocarpus*. Before the pool could freeze solid, the tide would return and break the ice, and as long as they were not actually solidified, the plants experienced no inconvenience. Plants like the fuci can even endure some hours of actual congelation and being frozen so stiff that they are brittle, if the next tide releases them.

This hardiness enables the algae to extend to the waters well up towards the poles, and to thrive in places where the summer temperature of the water is only about 36 degrees Fahr. Some of the *Laminariaceae* have even been known to grow luxuriantly and produce fruit, zoospores, during months when the water was never above 28 degrees Fahr.

It must not be supposed, however, that the vegetation on our



Webster, Hollis. 1900. "NAUCORIA CHRISTINAE." *Rhodora* 2, 127–130.

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