

MEROTERPENOIDS FROM *CYSTOSEIRA* SPP.

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As part of our phytochemical studies of *Cystoseira* species occurring along the coasts of Sicily (1), we have examined *Cystoseira mediterranea* Sauvageau and *Cystoseira ercegovicii* Giaccone (Cystoseiraceae). *C. mediterranea* afforded the same meroterpenoids previously isolated from *Cystoseira stricta* (Mont.) Sauvageau, namely (in order of increasing polarity) cystoketal chromane, isocystoketal, cystoketal, strictaepoxide, isostrictaketol, isobalearone, strictaketol, and balearone (2). The near identity of the complex pattern of secondary metabolites together with the morphological similarity [the single difference between the two species appears to be the habit, monopodial in *C. mediterranea* and caespitose in *C. stricta* (3)] suggests *C. stricta* and *C. mediterranea* to be varieties of the same species, rather than "bonae species," thus supporting the opinion (4) that difference in habit taken alone cannot be assumed as sole criterion to give an entity the rank of species.

In the case of *C. ercegovicii*, we isolated 2-[(2'E,6'E,14'E)-10',11'-dihydroxy-3',7',11',15'-tetramethylhexadeca-2',6',14'-trien]-1,4-dihydroxy-6-methylbenzene and the corresponding quinone. These two compounds were originally reported from a species referred to as *C. stricta* var. *spicata* (5), subsequently changed to *Cystoseira caespitosa* (6); this led us to morphological reexamination of the plant material previously analyzed and deposited in the Herbarium of the Department of Botany, Catania, and resulted in its identification as a new species which has been named *Cystoseira hyblaea* G. Giaccone (7). Moreover, the last two substances were the only meroterpenoids present in another *Cystoseira* sample identified as *Cystoseira crinita* Bory. Again, this result required reconsideration of the taxon's identity, thought to be *C. crinita*, from which geranylgeraniol and a variety of linear diterpenoids, formally derived from its oxidation, had been isolated (8-10). After reexamination of the deposited plant material it was indeed identified as *Cystoseira brachycarpa* J. Agardh emend. Giaccone (7), a species morphologically very close to *C. crinita*. Hence, the natural source of crinitol, geranylgeraniol, eleanolone, (2E,10E)-1,6-dihydroxy-7-methylene-13-keto-3,11,15-trimethylhexadeca-2,10,14-triene, (2E,5E,10E)-1,7-dihydroxy-13-keto-3,7,11,15-tetramethylhexadeca-2,6,10,14-tetraene, and (2E,10E)-1-hydroxy-6,13-diketo-7-methylene-3,11,15-trimethylhexadeca-2,10,14-triene is *C. brachycarpa*, not *C. crinita*.

EXPERIMENTAL

PLANT MATERIAL.—*C. mediterranea* was collected near Scilla on the Strait of Messina in April 1987; *C. ercegovicii* at Isola delle Correnti near Pachino, Sicily in March 1987; and *C. crinita* at Portopalo near Pachino, Sicily in March 1987. All the samples are maintained in the Herbarium of the Department of Botany, Catania, Italy.

EXTRACTION AND ISOLATION.—Air-dried material was extracted with CH₂Cl₂, and the extract evaporated to give a residue that was subjected to repeated cc on Si gel. Purity of the isolated compounds was checked by tlc. Identification was made by comparison of the spectra (ms, uv, ir, ¹H nmr) with those of authentic samples. Full details of the isolation and identification of compounds have been given in previous papers (1, 2, 5, 11).

ACKNOWLEDGMENTS

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LITERATURE CITED

1. V. Amico, G. Oriente, P. Neri, M. Piattelli, and G. Ruberto, *Phytochemistry*, **26**, 1715 (1987) and references cited therein.
2. V. Amico, F. Cunsolo, M. Piattelli, and G. Ruberto, *Phytochemistry*, **26**, 1719 (1987).
3. C. Sauvageau, *Bull. Stat. Biol., Arcachon*, **14**, 133 (1912).
4. M. Roberts, "Modern Approaches to the Taxonomy of Red and Brown Algae," Ed. by D.E.G. Irvine and J.H. Price, Academic Press, London, 1978, pp. 399-422.
5. V. Amico, G. Oriente, M. Piattelli, G. Ruberto, and C. Tringali, *Phytochemistry*, **21**, 421 (1982).

6. V. Amico, G. Oriente, M. Piattelli, G. Ruberto, and C. Tringali, *J. Chem. Res., Synop.*, 262 (1982).
7. G. Giaccone, *Boll. Acc. Gioiemia Sci. Nat.*, **18**, 429 (1985).
8. V. Amico, G. Oriente, M. Piattelli, C. Tringali, E. Fattorusso, S. Magno, L. Mayol, C. Santacroce, and D. Sica, *Tetrahedron Lett.*, 937 (1976).
9. V. Amico, G. Oriente, M. Piattelli, G. Ruberto, and C. Tringali, *Phytochemistry*, **19**, 2759 (1980).
10. V. Amico, G. Oriente, M. Piattelli, G. Ruberto, and C. Tringali, *Phytochemistry*, **20**, 1085 (1981).
11. V. Amico, F. Cunsolo, L. Mayol, M. Piattelli, and G. Ruberto, *J. Nat. Prod.*, **50**, 449 (1987).

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ERRATUM

Maurice Shamma has requested the following erratum for the paper entitled "Five New Alkaloids from *Colchicum ritchii*," *J. Nat. Prod.*, **50**, 684 (1987).

Page 687, next to bottom paragraph should read: "The fourth alkaloid is the known CC-10 [7] which had previously been obtained from *C. cornigerum* (4). ¹H-nmr chemical shifts for CC-10 are quoted around expression 7. The shift assignments, as well as the boat-like conformation of ring B, were confirmed through nOe experiments (see Experimental section)."

Page 684, Abstract: Cancel the last two sentences which read "Androcymbine, which was previously known only in the levorotatory form, has now been found as the dextrorotatory enantiomer 7. It is accompanied in the plant by the related base (+)-colchiritchine [8]."

Page 686, Table 2; page 688, lines 1, 6, 11, and 32; and page 689, line 4: Replace "(+)-androcymbine [7]" with "(+)-CC-10 [7]."