

THE OCCURRENCE OF C₂₈ STEROLS IN RED ALGAE

GEORGES COMBAUT, LOUIS CODOMIER, JEAN TESTE and MARIANNE PEDERSÈN*

Groupe de Recherches en Biologie et Chimie des Végétaux Marins, Université de Perpignan, France; *Institute of Physiological Botany, University of Uppsala, Sweden

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Key Word Index—*Amansia glomerata*; *Halopythis pinastroides*; *Lenormandia prolifera*; Rhodophyceae; Rhodomelaceae; sterols; 24-methylenecholesterol.

Abstract—*Lenormandia prolifera* and *Amansia glomerata* contain large amounts of 24-methylenecholesterol. These two algae belong to the *Amansia* group of Rhodomelaceae as do *Rytiphloea tinctoria* and *Vidalia volubilis*, which are already known to be able to alkylate sterols at C-24. *Halopythis pinastroides* is an exception in the *Amansia* group, no C-28 sterols being present in this alga.

INTRODUCTION

Rytiphloea tinctoria was the first red alga in which C₂₈ sterols were found [1], campesterol being the major compound of the sterol fraction. *Vidalia volubilis* [2] presents another exception to the theory that the red algae are incapable of alkylation at C-24, 24-methylenecholesterol being the main sterol of this alga. These two algae belong to the *Amansia* group of Rhodomelaceae, which appears to be a very interesting group for sterol studies. Thus we report now the sterol compositions of three other species, namely *Lenormandia prolifera*, *Amansia glomerata* and *Halopythis pinastroides*.

RESULTS AND DISCUSSION

The sterol-TMSi derivatives obtained from the sterols of the algae were submitted to GC and GC/MS analysis. *Lenormandia prolifera* and *Amansia glomerata* contained 24-methylenecholesterol and only traces of cholesterol, desmosterol and sitosterol, while the sterols of *Halopythis pinastroides* were cholesterol and desmosterol in the ratio 2:1. When *Halopythis pinastroides* was freshly extracted with EtOH-CHCl₃ (1:1) the cholesterol to desmosterol ratio was 1:2. In a recent study [2], *Halopythis pinastroides* was reported to have a desmosterol to cholesterol ratio of 1:1 emphasizing the great importance of the solvent extraction procedure on sterol analysis, an effect demonstrated also for *Rhodomenia palmata* [3]. However, these results show consistently that C₂₇ sterols are the major sterols of *Halopythis pinastroides*; no C₂₈ sterol was identified in this alga.

Thus four algae of the *Amansia* group, *Rytiphloea tinctoria* with campesterol, and *Lenormandia prolifera*, *Amansia glomerata* and *Vidalia volubilis* with 24-methylenecholesterol, are capable of alkylation at C-24. On the contrary, *Halopythis pinastroides* did not produce C₂₄ substituted sterols. Moreover, it has been shown that the pigment floridorubin present in *Rytiphloea tinctoria* [4], *Lenormandia prolifera* [5] and *Amansia glomerata* (P. Saenger, personal communication) was absent in

Halopythis pinastroides. Thus we believe that the taxonomic position of this latter alga could be usefully re-examined by biological studies, perhaps to confirm that *Halopythis pinastroides* is an exception in the *Amansia* group of Rhodomelaceae.

EXPERIMENTAL

Extraction. *Lenormandia prolifera* (C.Ag.) J.Ag. and *Amansia glomerata* C.Ag. were collected in Victoria, Australia; *Halopythis pinastroides* (G.) Kütz in Le Caro, France. CHCl₃ extraction of 1.1 g of air-dried *Lenormandia prolifera*, 0.8 g of air-dried *Amansia glomerata* and 1.0 g of freeze-dried *Halopythis pinastroides* yielded 11 mg, 7 mg and 15 mg respectively of lipid.

Sterol analysis. After KOH-MeOH saponification of the CHCl₃ extracts, the unsaponifiable residues (8 mg, 5 mg and 5 mg respectively) were dried and silylated by HMDS + TMCS in pyridine. The sterol-TMSi derivatives were submitted to GLC and GC/MS [6]. Sterols were identified by comparison with literature data [6, 7].

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