

NATIONAL AGRICULTURAL LIBRARY ARCHIVED FILE

Archived files are provided for reference purposes only. This file was current when produced, but is no longer maintained and may now be outdated. Content may not appear in full or in its original format. All links external to the document have been deactivated. For additional information, see <http://pubs.nal.usda.gov>.

Alternative Farming Systems Information Center of the National Agricultural Library
Agricultural Research Service, U.S. Department of Agriculture

Aquaculture: Spirulina and Other Microalgae January 1986 - April 1994

TITLE: Aquaculture: Spirulina and Other Microalgae
AUTHOR: Ann Townsend Young
Aquaculture Information Center
National Agricultural Library
PUBLICATION DATE: August 1994
SERIES: QB 94-47
NAL Call no.: az5071.N3 no.94-47
CONTACT: Alternative Farming Systems Information Center
National Agricultural Library
Room 123, 10301 Baltimore Ave.
Beltsville, MD 20705-2351
Telephone: (301) 504-6559
<http://afsic.nal.usda.gov>

ISSN: 1052-5378

United States Department of Agriculture
National Agricultural Library
10301 Baltimore Blvd.
Beltsville, Maryland 20705-2351

Aquaculture: Spirulina and Other Microalgae
January 1986 - April 1994

Quick Bibliography Series: QB 94-47

81 citations from AGRICOLA

Ann Townsend Young
Aquaculture Information Center

August 1994

=====
National Agricultural Library Cataloging Record:

Young, Ann Townsend

Aquaculture : spirulina & other microalgae.

(Quick bibliography series ; 94-47)

1. Spirulina--Bibliography. 2. Microalgae--Bibliography. 3.

Algae culture--Bibliography. I. Title.

aZ5071.N3 no.94-47
=====

About the Quick Bibliography Series

Bibliographies in the Quick Bibliography Series of the National Agricultural Library, are intended primarily for current awareness, and as the title of the series implies, are not indepth exhaustive bibliographies on any given subject. However, the citations are a substantial resource for recent investigations on a given topic. They also serve the purpose of bringing the literature of agriculture to the interested user who, in many cases, could not access it by any other means. The bibliographies are derived from computerized on-line searches of the AGRICOLA data base. Timeliness of topic and evidence of extensive interest are the selection criteria.

The author/searcher determines the purpose, length, and search strategy of the Quick Bibliography. Information regarding these is available upon request from the author/searcher.

Copies of this bibliography may be made or used for distribution without prior approval. The inclusion or omission of a particular publication or citation may not be construed as endorsement or disapproval.

Document Delivery Information:

Read Request Library Materials, <http://www.nal.usda.gov/nal-services/request-library-materials>,
to get directions for ordering publications through interlibrary loan.

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-5881 (voice) or (202) 720-7808 (TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.
=====

AGRICOLA

Citations in this bibliography were entered in the AGRICOLA database between January 1979 and the present.

SAMPLE CITATIONS

Citations in this bibliography are from the National Agricultural Library's AGRICOLA database. An explanation of sample journal article, book, and audiovisual citations appears below.

JOURNAL ARTICLE:

Citation # NAL Call No.
Article title.
Author. Place of publication: Publisher. Journal Title.
Date. Volume (Issue). Pages. (NAL Call Number).

Example:

1 NAL Call No.: DNAL 389.8.SCH6
Morrison, S.B. Denver, Colo.: American School Food Service
Association. School foodservice journal. Sept 1987. v. 41
(8). p.48-50. ill.

BOOK:

Citation # NAL Call Number
Title.
Author. Place of publication: Publisher, date. Information
on pagination, indices, or bibliographies.

Example:

1 NAL Call No.: DNAL RM218.K36 1987
Exploring careers in dietetics and nutrition.
Kane, June Kozak. New York: Rosen Pub. Group, 1987.
Includes index. xii, 133 p.: ill.; 22 cm. Bibliography:
p. 126.

AUDIOVISUAL:

Citation # NAL Call Number
Title.
Author. Place of publication: Publisher, date.
Supplemental information such as funding. Media format
(i.e., videocassette): Description (sound, color, size).

Example:

1 NAL Call No.: DNAL FNCTX364.A425 F&N AV
All aboard the nutri-train.
Mayo, Cynthia. Richmond, Va.: Richmond Public Schools,
1981. NET funded. Activity packet prepared by Cynthia
Mayo. 1 videocassette (30 min.): sd., col.; 3/4 in. +
activity packet.

=====

Aquaculture: Spirulina and Other Microalgae

SEARCH STRATEGY

Set	Description
---	-----
S1	SPIRULINA/TI
S2	CHLORELLA/TI
S3	DUNALIELLA/TI
S4	SCENEDESMUS/TI
S5	PORPHYRIDIDIUM/TI
S6	MICROALG?/TI
S7	MICRO/TI
S8	ALGA?/TI
S9	MICRO/TI (1N)ALGA?/TI
S10	(SPIRULINA OR CHLORELLA OR DUNALIELLA OR SCENEDESMUS OR PORPHYRIDIDIUM OR MICROALG? OR MICRO (1N)ALGA?)/TI
S11	AQUACULTURE/TI
S12	ALGOCULTURE/TI
S13	MARICULTURE/TI
S14	CULTIVAT?/TI
S15	CULTURE/TI
S16	PHYTOTECNOLOG?/TI
S17	(AQUACULTURE OR ALGOCULTURE OR MARICULTURE OR CULTIVAT? OR CULTURE OR PHYTOTECNOLOG?)/TI
S18	RACEWAY?/TI
S19	TANK?/TI
S20	BIOMASS/TI
S21	PRODUCTION/TI
S22	UTILIZATION/TI
S23	USE/TI
S24	FOOD?/TI
S25	FEED?/TI
S26	MEAL?/TI
S27	DIET/TI
S28	NUTRITION/TI
S29	COMMERCIAL/TI
S30	INDUSTR?/TI
S31	ECONOMIC?/TI
S32	BIOTECHNOLOG?/TI
S33	MARKET?/TI
S34	BIOREACTOR?/TI
S35	(RACEWAY? OR TANK? OR BIOMASS OR PRODUCTION OR UTILIZATION OR USE OR FOOD? OR FEED? OR MEAL? OR DIET OR NUTRITION OR COMMERCIAL OR INDUSTR? OR ECONOMIC? OR BIOTECHNOLOG? OR MARKET? OR BIOREACTOR?)/TI
S36	S17 OR S35
S37	S36 AND S10
S38	PY=1986 : PY= 1989
S39	PY=1990 : PY=1994
S40	S38 OR S39
S41	S40 AND S37

=====

Aquaculture: Spirulina and Other Microalgae

1 NAL Call. No.: 450 J8212J
Some peculiarities of the community of *Dunaliella* Teod. species
and bacteria in culture
Borysova, O.V.
Kyiv : "Naukova dumka"; 1986.
Ukrains'kyi botanichnyi zhurnal v. 43 (4): p. 60-63; 1986.
Includes references.

Language: Ukrainian

Descriptors: *Dunaliella*; Species; Aquatic communities; Bacteria

2 NAL Call. No.: SH391.S67F6
Algoculture la spirulina, un espoir pour le monde de la faim
[Algoculture, the spirulina, a hope for world hunger].
Fox, Ripley D.
La Calade, Aix-en-Provence : Edisud,; 1986.
319 p. : ill. ; 24 cm. Originally presented as the author's
thesis (doctoral-1'Universite Louis Pasteur de Strasbourg).
Bibliography: p. 277-288.

Language: French

Descriptors: *Spirulina*; Algae culture; Algae as food

3 NAL Call. No.: TP1.J686
The application of environmental stress in the biotechnological
exploitation of microalgae.
Dubinsky, Z.
London : Elsevier Applied Science Publishers; 1988.
Journal of chemical technology and biotechnology v. 42 (4): p.
306-308; 1988. Includes references.

Language: English

Descriptors: Algae; Biotechnology; Environment; Stress;
Temperatures; Plant composition

4 NAL Call. No.: TD930.A32
Application of *Spirulina* mixed feed in the breeding of bay
scallop. Zhou, B.; Liu, W.; Qu, W.; Tseng, C.K.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 229-232; 1991. Includes
references.

Language: English

Descriptors: Shandong; Scallops; Aquaculture; Feeding; *Spirulina*;
Hatcheries

5 NAL Call. No.: TD420.A1E5
Binding of metal ions by particulate biomass derived from

Chlorella vulgaris and Scenedesmus quadricauda.
Harris, P.O.; Ramelow, G.J.
Washington, D.C. : American Chemical Society; 1990 Feb.
Environmental science & technology v. 24 (2): p. 220-228; 1990
Feb. Includes references.

Language: English

Descriptors: Water pollution; Pollutants; Metal ions; Ion uptake;
Chlorella vulgaris; Scenedesmus quadricauda; Water purification;
Binding; Biomass; Adsorption; Desorption

6 NAL Call. No.: QR1.L47
Bioactivity of immobilized microalgal cells: application
potential of vegetable sponge in microbial biotechnology.
Iqbal, M.; Zafar, S.I.
Oxford ; 1993 Dec.
Letters in applied microbiology v. 17 (6): p. 289-291; 1993 Dec.
Includes references.

Language: English

Descriptors: Rhodophyta; Immobilization; Plant tissues; Fruits;
Luffa aegyptiaca; Carbohydrate metabolism; Polysaccharides;
Pigments

7 NAL Call. No.: FICHE S-72
Bio-process of anaerobically digested pig manure for production
of Spirulina sp.
Yang, P.Y.; Duerr, E.O.
St. Joseph, Mich. : The Society; 1987.
American Society of Agricultural Engineers (Microfiche
collection) (fiche no. 87-6056): 22 p. ill; 1987. Paper
presented at the 1987 Summer Meeting of the American Society of
Agricultural Engineers. Available for purchase from: The American
Society of Agricultural Engineers, Order Dept., 2950 Niles Road,
St. Joseph, Michigan 49085. Telephone the Order Dept. at (616)
429-0300 for information and prices. Includes references.

Language: English

Descriptors: Pig farming; Manures; Anaerobic treatment;
Digestion; Algae culture; Saprospira; Feed crops

8 NAL Call. No.: TP248.2.B562
Bioremoval of heavy metals by the use of microalgae.
Wilde, E.W.; Benemann, J.R.
Oxford ; New York : Pergamon Press,; 1993.
Biotechnology advances v. 11 (4): p. 781-812; 1993. Includes
references.

Language: English

Descriptors: Water pollution; Heavy metals; Sorption; Algae;

Literature reviews

9 NAL Call. No.: QR53.B56
Biosynthesis of high concentrations of an exopolysaccharide during the cultivation of the microalga *Botryococcus braunii*.
Fernandes, H.L.; Tome, M.M.; Lupi, F.M.; Fialho, A.M.; Sa-Correia, I.; Novais, J.M.
Surrey : Science and Technology Letters; 1989 Jun.
Biotechnology letters v. 11 (6): p. 433-436; 1989 Jun. Includes references.

Language: English

Descriptors: Algae; Cultivation; Polysaccharides; Biosynthesis

10 NAL Call. No.: TD930.A32
The biotechnology of cultivating *Dunaliella* for production of beta-carotene rich algae.
Ben-Amotz, A.; Shaish, A.; Avron, M.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 233-235; 1991. Includes references.

Language: English

Descriptors: *Dunaliella*; Algae culture; Beta-carotene; Biosynthesis; Light intensity; Growth; Inhibitors; Isomerization; Phytoene; Food biotechnology; Mass; Cultivation; Salt tolerance; Glycerol

11 NAL Call. No.: TA166.T72
The biotechnology of cultivating the halotolerant alga *Dunaliella*.
Ben-Amotz, A.; Avron, M.
Cambridge : Elsevier Publications; 1990 May.
Trends in biotechnology v. 8 (5): p. 121-126. ill; 1990 May.
Includes references.

Language: English

Descriptors: *Dunaliella*; Biotechnology; Algae culture; Plant products; Salt tolerance

12 NAL Call. No.: TD930.A32
Cell fragility--the key problem of microalgae mass production in closed photobioreactors.
Gudin, C.; Chaumont, D.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 145-151; 1991. Includes references.

Language: English

Descriptors: France; Algae culture; Algae; Species; Bioreactors;

Biomass production; Light regime; Optimization; Pumps; Operation;
Mixing; Cells; Damage; Hydrodynamics; Stresses

13 NAL Call. No.: TP248.27.A46S62 1987
Chilean experiences on microalgae culture.
Ayala, F.; Vargas, T.; Cardenas, A.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p.
228-236. ill; 1988. Proceedings of the 4th International
Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France.
Includes references.

Language: English

Descriptors: Chile; Saprospira; Dunaliella; Algae culture; Layout
and planning; Natural light; Feasibility studies

14 NAL Call. No.: SH389.H36
CRC Handbook of microalgal mass culture.. Handbook of microalgal
mass culture Microalgal mass culture
Richmond, Amos
Boca Raton, Fla. : CRC Press,; 1986.
528 p. : ill. ; 27 cm. Includes bibliographies and index.

Language: English

Descriptors: Algae culture; Handbooks, manuals, etc

15 NAL Call. No.: TP248.27.A46S62 1987
Cultivation and application of microalgae in People's Republic of
China. Li, S.H.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p.
41-54; 1988. Proceedings of the 4th International Meeting,
September 15-17, 1987, Villeneuve-d'Ascq, France. Literature
review. Includes references.

Language: English

Descriptors: China; Algae culture; History; Research projects;
Research policy

16 NAL Call. No.: QR1.E9
Culture and nitrite uptake in immobilized Scenedesmus obliquus.
Jeanfils, J.; Thomas, D.
Berlin, W. Ger. : Springer International; 1986 Aug.
Applied microbiology and biotechnology v. 24 (5): p. 417-422.
ill; 1986 Aug. Includes references.

Language: English

Descriptors: Scenedesmus; Immobilization; Nitrites; Uptake;
Assimilation

17 NAL Call. No.: 381 J8224
Detailed study of anaerobic digestion of spirulina maxima algal biomass. Samson, R.; LeDuy, A.
New York, N.Y. : John Wiley & Sons; 1986 Jul.
Biotechnology and bioengineering v. 28 (7): p. 1014-1023. ill;
1986 Jul. Includes 31 references.

Language: English

Descriptors: Saprospira; Anaerobic conditions; Biomass accumulation; Anaerobic digesters; Methane production

18 NAL Call. No.: TD930.A32
Development of an industrial-scale process for the heterotrophic production of a micro-algal mollusc feed.
Day, J.D.; Edwards, A.P.; Rodgers, G.A.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 245-249; 1991. Includes references.

Language: English

Descriptors: Uk; Algae culture; Industrial methods; Dry feeds; Powders; Mollusca; Feeding; Trials

19 NAL Call. No.: TP248.27.A46S62 1987
Development of microalgal systems for the production of liquid fuels. Barclay, W.; Wyman, C.; Lewin, R.A.; Cheng, L.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p. 55-64; 1988. Proceedings of the 4th International Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France. Includes references.

Language: English

Descriptors: U.S.A.; Algae culture; Fuel crops; Federal programs; Research projects; Fuels

20 NAL Call. No.: QK569.P65D86 1992
Dunaliella physiology, biochemistry, and biotechnology.
Avron, Mordhay; Ben-Amotz, Ami,
Boca Raton : CRC Press,; 1992.
240 p. : ill. ; 25 cm. Includes bibliographical references and index.

Language: English

Descriptors: Dunaliella

21 NAL Call. No.: QR1.Z4

Effect of cultivation temperature and light intensity on fatty acid production in the red alga *Porphyridium cruentum*.
Rezanka, T.; Doucha, J.; Mares, P.; Podojil, M.
Berlin, E. Ger. : Akademie-Verlag; 1987.
Journal of basic microbiology v. 27 (5): p. 275-278; 1987.
Includes references.

Language: English

Descriptors: Algae; Temperature relations; Cultivation; Light flux; Unsaturated fatty acids

22 NAL Call. No.: RA1270.P35A1
Effect of increasing copper and salinity on glycerol production by *Dunaliella salina*.
Lustigman, B.; McCormick, J.M.; Dale, G.; McLaughlin, J.J.A. New York, N.Y. : Springer-Verlag; 1987 Feb.
Bulletin of environmental contamination and toxicology v. 38 (2): p. 359-362; 1987 Feb. Includes references.

Language: English

Descriptors: *Dunaliella*; Glycerol; Production; Copper; Salinity; Toxicity

23 NAL Call. No.: TD930.A32
The extensive commercial cultivation of *Dunaliella salina*.
Schlipalius, L.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 241-243; 1991. Includes references.

Language: English

Descriptors: South australia; *Dunaliella*; Species; Algae culture; Industrial methods; Beta-carotene; Crystallization; Food colorants; Soybean oil; Diet; Supplements; Dry feeds; Powders; Algal protein

24 NAL Call. No.: QD415.A1J62
gamma-linolenic acid production by microalgae.
Hirano, M.; Mori, H.; Miura, Y.; Matsunga, N.; Nakamura, N.; Matsunaga, T. Totowa, N.J. : Humana Press; 1990.
Applied biochemistry and biotechnology v. 24/25: p. 183-193; 1990. Includes references.

Language: English

Descriptors: Linolenic acid; Biological production; Algae

25 NAL Call. No.: QD415.A1J62
Genetic engineering of microalgae for fuel production: scientific note. Dunahay, T.G.; Jarvis, E.E.; Zeiler, K.G.; Roessler, P.G.;

Brown, L.M. Totowa, N.J. : Humana Press; 1992.
Applied biochemistry and biotechnology v. 34/35: p. 331-339;
1992. Paper presented at the "Thirteenth Symposium on
Biotechnology for Fuels and Chemicals," May 6-10, 1991, Colorado
Springs, Colorado. Includes references.

Language: English

Descriptors: Chlorella ellipsoidea; Cyclotella; Chlorophyta;
Genetic transformation; Direct DNAuptake; Gene transfer;
Electroporation; Structural genes; Nitrate reductase; Acetyl-coa
carboxylase; Carboxy-lyases; Gene expression; Reporter genes;
Luciferase

26 NAL Call. No.: QR1.Z4
Glycerol production by Dunaliella bioculata.
Ahmed, A.M.; Zidan, M.A.
Berlin, E. Ger. : Akademie-Verlag; 1987.
Journal of basic microbiology v. 27 (8): p. 419-425; 1987.
Includes references.

Language: English

Descriptors: Dunaliella; Glycerol; Production; Osmotic pressure;
Photosynthesis

27 NAL Call. No.: QR53.B56
Glycerol production by Dunaliella tertiolecta immobilized within
Ca-alginate beads.
Grizeau, D.; Navarro, J.M.
Kew, Eng. : Science and Technology Letters; 1986 Apr.
Biotechnology letters v. 8 (4): p. 261-264; 1986 Apr. Includes
references.

Language: English

Descriptors: Dunaliella; Glycerol; Production; Immobilization;
Alginates

28 NAL Call. No.: 442.8 AR26
Green microalgae can use naphthalenesulfonic acids as sources of
sulfur. Soeder, C.J.; Hegewald, E.; Kneifel, H.
Berlin, W. Ger. : Springer International; 1987.
Archives of microbiology v. 148 (4): p. 260-263; 1987. Includes
references.

Language: English

Descriptors: Chlorella; Scenedesmus; Sulfur; Metabolism;
Naphthalene

29 NAL Call. No.: QD415.A1J62
Growth characteristics of microalgae in high-concentration CO2

gas, effects of culture medium trace components, and impurities thereon.

Negoro, M.; Shioji, N.; Ikuta, Y.; Makita, T.; Uchiumi, M.
Totowa, N.J. : Humana Press; 1992.

Applied biochemistry and biotechnology v. 34/35: p. 681-692;
1992. Paper presented at the "Thirteenth Symposium on
Biotechnology for Fuels and Chemicals," May 6-10, 1991, Colorado
Springs, Colorado. Includes references.

Language: English

Descriptors: Chlorophyta; Bacillariophyta; Exhaust gases;
Biological treatment; Carbon dioxide; Photosynthesis; Cell
culture; Nickel; Vanadium; Air pollution; Culture media

30

NAL Call. No.: 381 J8224

Improved performance of intensive semicontinuous cultures of
Scenedesmus by biomass recirculation.

De la Noue, J.; Ni Eidhin, D.

New York, N.Y. : John Wiley & Sons; 1988 Apr05.

Biotechnology and bioengineering v. 31 (5): p. 397-406. ill; 1988
Apr05. Includes references.

Language: English

Descriptors: *Scenedesmus*; Culture media; Biomass; Recycling

31

NAL Call. No.: QD415.A1J62

Influence of ammonium chloride on growth and fatty acid
production by *Spirulina platensis*.

Manabe, E.; Chiba, Japan; Hirano, M.; Takano, H.; Ishikawa-Doi,
N.; Sode, K.; Matsunaga, T.

Totowa, N.J. : Humana Press; 1992.

Applied biochemistry and biotechnology v. 34/35: p. 273-281;
1992. Paper presented at the "Thirteenth Symposium on
Biotechnology for Fuels and Chemicals," May 6-10, 1991, Colorado
Springs, Colorado. Includes references.

Language: English

Descriptors: *Spirulina*; Lipogenesis; Fatty acids; Linolenic acid;
Nutrient availability; Ammonium chloride

32

NAL Call. No.: QR1.M562

Influence of culture density, pH, organic acids and divalent
cations on the removal of nutrients and metals by immobilized
Anabaena doliolum and *Chlorella vulgaris*.

Mallick, N.; Rai, L.C.

Oxford, OX, UK : Published by Rapid Communications of Oxford Ltd
in association with UNESCO and in collaboration with the
International Union of Microbiological Societies, c1990-; 1993
Mar.

World journal of microbiology & biotechnology v. 9 (2): p.
196-201; 1993 Mar. Includes references.

Language: English

Descriptors: Anabaena doliolum; Chlorella vulgaris; Alginates; Immobilization; Uptake; Nutrients; Metals; Density; Ph; Organic acids; Cations; Water pollution; Drinking water

33

NAL Call. No.: QK1.A28

An investigation of cytological effects of Spirulina culture filtrate on mitosis in *Allium cepa*.

Changoiwala, M.; Chatterjee, P.

Meerut, India : Society for Advancement of Botany; 1987 Jun. Acta botanica Indica v. 15 (1): p. 9-17. ill; 1987 Jun. Includes references.

Language: English

Descriptors: Saprospira; Culture filtrates; *Allium cepa*; Mitosis; Growth inhibitors

34

NAL Call. No.: TP248.2.W69

Large scale culture of microalgae: the new agricultural revolution. Karuna-Karan, A.; Cysewski, G.; Anderson, D.; Nester, E.; Haigh, G. London : Online, c1986-; 1986.

World biotech report 1986 : proceedings of Biotech 86 Europe held in London, May 1986. v. 2 pt. 7 p. 37-51. ill; 1986. Includes references.

Language: English

Descriptors: Cash crops; Algae culture; Beta-carotene; Land use; Biotechnology; Innovations; Value added; Fluorescent dyes; Pigments; Fertilizer technology

35

NAL Call. No.: 384 F773

Lipids and macromolecular lipids of the hydrocarbon-rich microalga *Botryococcus braunii*. Chemical structure and biosynthesis. Geochemical and biotechnological importance.

Metzger, P.; Largeau, C.; Casadevall, E.

Wien : Springer-Verlag; 1991.

Fortschritte der Chemie organischer Naturstoffe; Progress in the chemistry of organic natural products v. 57: p. 1-70; 1991. Literature review. Includes references.

Language: English

Descriptors: Algae; Lipogenesis; Hydrocarbons; Fatty acids; Triacylglycerols; Sterols; Carotenoids; Cell walls; Polymers; Aldehydes; Biosynthesis; Biotechnology; Geochemistry; Literature reviews

36

NAL Call. No.: 450 J829

Macro- and microalgal production within a *Nitella opaca* bed in

Lake Thingvallavatn, Iceland.
Kairesalo, T.; Jonsson, G.S.; Gunnarsson, K.; Jonasson, P.M.
Oxford : Blackwell Scientific; 1989 Jun.
Journal of ecology v. 77 (2): p. 332-342; 1989 Jun. Includes
references.

Language: English

Descriptors: Nitella; Plant production; Lakes; Plant ecology;
Seasonal growth; Biomass accumulation; Measurement;
Photosynthesis; Benthos; Fauna; Plant communities; Metabolism

37 NAL Call. No.: 307.8 J82
Market applications for microalgae.
Kyle, D.
Champaign, Ill. : The Society; 1989 May.
Journal of the American Oil Chemists' Society v. 66 (5): p.
648-651; 1989 May.

Language: English

Descriptors: Algae; Microorganisms; Industrial applications; Oils
and fats industry; Food biotechnology; Algae culture

38 NAL Call. No.: TP248.27.A46S62 1987
Mass culture of *Porphyridium cruentum*: a multiproduct strategy for
the biomass valorisation.
Thepenier, C.; Chaumont, D.; Gudin, C.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p.
413-420. ill; 1988. Proceedings of the 4th International
Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France.
Includes references.

Language: English

Descriptors: Algae culture; In vitro; Tubes; Polysaccharides;
Enzymes; Modifications

39 NAL Call. No.: TD930.A32
Meat meal and algae (*Spirulina*) as ingredients of calf starter
rations. Bhaskar, B.V.; Amrith Kumar, M.N.; Sundareshan, K.;
Sampath, S.R. London : Elsevier Applied Science Publishers; 1986.
Agricultural wastes v. 15 (1): p. 51-58; 1986. Includes
references.

Language: English

Descriptors: Calves; Feeding; Diet studies; Meat meal;
Saprospira; Algae meal; Growth rate; Liveweight gains;
Metabolism; Total digestible nutrients; Crude proteins; Feed
evaluation

40

NAL Call. No.: TP368.C7

Microalgae as food and supplement.

Kay, R.A.

Boca Raton, Fla. : CRC Press; 1991.

Critical reviews in food science and nutrition v. 30 (6): p. 555-573. charts; 1991. Literature review. Includes references.

Language: English

Descriptors: Algae; Algae culture; Energy content; Nutrient content; Nutrient density; Food composition tables; Food processing; Food supplements; Commercial farming; Energy cost of production; Literature reviews

Abstract: The microalgae *Chlorella* spp., *Dunaliella* spp., and *Scenedesmus* spp., and the cyanobacteria *Spirulina* spp., and *Aphanizomenon flos-aquae*, are being used as nutrient-dense foods and sources of fine chemicals. They have significant amounts of lipid, protein, chlorophyll, carotenoids, vitamins, minerals, and unique pigments. They may also have potent probiotic compounds that enhance health. Their historical and current use are reviewed in this article.

41

NAL Call. No.: TA166.T72

Microalgae biotechnology.

Benemann, J.R.; Tillett, D.M.; Weissman, J.C.

Cambridge : Elsevier Publications; 1987 Feb.

Trends in biotechnology v. 5 (2): p. 47-53; 1987 Feb. Includes references.

Language: English

Descriptors: Algae culture; Biotechnology; Production costs; Products; Photosynthesis; Waste treatment

42

NAL Call. No.: 381 J8224

Microalgae production: technical and economic evaluations. Tapie, P.; Bernard, A.

New York, N.Y. : John Wiley & Sons; 1988 Sep20.

Biotechnology and bioengineering v. 32 (7): p. 873-885; 1988 Sep20. Includes references.

Language: English

Descriptors: Algae; Production; Biotechnology; Photosynthesis

43

NAL Call. No.: QL461.S65

Microalgae *Spirulina maxima* (Oscillatoriaceae) in the larval diet of the screwworm (Diptera: Calliphoridae).

Friese, D.D.

Dalla, Tex. : Southwestern Entomological Society; 1992 Dec. The Southwestern entomologist v. 17 (4): p. 289-293; 1992 Dec.

Includes references.

Language: English

Descriptors: Cochliomyia hominivorax; Mass rearing; Diet;
Spirulina

44

NAL Call. No.: SH389.M53

Micro-algal biotechnology.

Borowitzka, Michael A.; Borowitzka, Lesley J.

Cambridge [England] ; New York : Cambridge University Press,;
1988. x, 477 p. : ill. ; 26 cm. Includes bibliographies and
indexes.

Language: English

Descriptors: Algae; Algae culture; Algae products

45

NAL Call. No.: S592.17.A73S46

Microalgal mass culture and forced development of biological
crusts in arid lands.

Knutsen, G.; Metting, B.

New York, N.Y. : M. Dekker; 1991.

Semiarid lands and deserts : soil resource and reclamation /
edited by J. Skujins. p. 487-506; 1991. (Books in soils, plants,
and the environment :). Includes references.

Language: English

Descriptors: Algae; Biomass production; Crusts; Reclamation; Arid
lands; Deserts

46

NAL Call. No.: 450 R34

Morphological variability of a Scenedesmus denticulatus Lagerh.
isolate in culture and some taxonomic revisions.

Fenwick, M.G.

Cambridge, Mass. : New England Botanical Club; 1988 Oct.

Rhodora v. 90 (864): p. 363-368. ill; 1988 Oct. Includes
references.

Language: English

Descriptors: Scenedesmus; Taxonomy; Plant morphology; Variations

47

NAL Call. No.: TP368.T73

Natural pigments from red microalgae for use in foods and
cosmetics.i. Arad, S.M.

Cambridge, U.K. : Elsevier Trends Journals; 1992 Apr.

Trends in food science & technology v. 3 (4): p. 92-97; 1992 Apr.
Includes references.

Language: English

Descriptors: Foods; Food colorants; Cosmetics; Pigments; Algae

48 NAL Call. No.: TP248.27.A46S62 1987
Nutrient preparation and low cost basin construction for village
production of Spirulina.
Fox, R.D.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p.
355-364. ill; 1988. Proceedings of the 4th International
Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France.
Includes references.

Language: English

Descriptors: Developing countries; Saprospira; Villages; Waste
water treatment; Algae culture; Layout and planning; Agitation;
Public health engineering; Cost benefit analysis

49 NAL Call. No.: RB152.J6
The nutritional quality of Scenedesmus acutus in a semi-
industrial plant in Peru.
Gross, R.; Schoeneberger, H.; Gross, U.
Park Forest : Chem-Orbital; 1986 May.
Journal of environmental pathology, toxicology, and oncology :
official organ of the International Society for Environmental
Toxicology and Cancer v. 6 (5/6): p. 47-57; 1986 May. Includes
references.

Language: English

Descriptors: Scenedesmus; Nutritional value; Plant proteins;
Plant analysis

50 NAL Call. No.: QR1.E9
Outdoor mass culture of Spirulina maxima in sea-water.
Tredici, M.R.; Papuzzo, T.; Tomaselli, L.
Berlin, W. Ger. : Springer International; 1986 Apr.
Applied microbiology and biotechnology v. 24 (1): p. 47-50. ill;
1986 Apr. Includes references.

Language: English

Descriptors: Saprospira; Culture media; Nitrogen; Ph; Biomass
determination

51 NAL Call. No.: TP248.27.A46S62 1987
Photobioreactors for the axenic mass cultivation of microalgae.
Pohl, P.; Kohlhase, M.; Martin, M.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.]..
209-217. ill; 1988. Proceedings of the 4th International Meeting,
September 15-17, 1987, Villeneuve-d'Ascq, France. Includes
references.

Language: English

Descriptors: German federal republic; Algae culture; In vitro; Growth chambers; Layout and planning; Aseptic state; Computer applications; Fluorescent light

52 NAL Call. No.: TP248.27.A46S62 1987
Photoinhibition as a limiting factor in outdoor cultivation of *Spirulina platensis*.
Vonshak, A.; Guy, R.
London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p. 365-370; 1988. Proceedings of the 4th International Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France. Includes references.

Language: English

Descriptors: Israel; Saprospira; Algae culture; Natural light; Photosynthesis; Inhibitors; Strain differences; Ponds; Resistance to injurious factors

53 NAL Call. No.: TP248.2.B562
The potential of microalgal biotechnology: a review of production and uses of microalgae.
De La Noue, J.; Pauw, N. de
Oxford : Pergamon Press; 1988.
Biotechnology advances v. 6 (4): p. 725-770; 1988. Literature review. Includes references.

Language: English

Descriptors: Algae; Algae culture; Biotechnology; Chemical composition; Nutritional value; Harvesting; Genetic engineering

54 NAL Call. No.: TD930.A32
Potential production of protoplasts from *Porphyridium* sp. using an enzymatic extract of its predator *Gymnodinium* sp.
Roth-Bejerano, N.; Van Moppes, D.; Sivan, A.; Arad (Malis), S.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 127-131; 1991. Includes references.

Language: English

Descriptors: Algae; Species; Genetic engineering; Protoplasts; Production; Genetic improvement; *Gymnodinium*; Enzymes; Extracts; Cell walls; Degradation; Osmotic pretreatment; Respiration rate; Photosynthesis; Growth curve; Cell division

55 NAL Call. No.: TP248.27.A46S62 1987
A prerequisite for industrial microalgaculture: efficient utilization of solar irradiance.
Richmond, A.

London : Elsevier Applied Science; 1988.
Algal biotechnology / edited by T. Stadler ... [et al.].. p.
237-244; 1988. Proceedings of the 4th International Meeting,
September 15-17, 1987, Villeneuve-d'Ascq, France. Includes
references.

Language: English

Descriptors: Israel; Algae culture; Growth chambers; Design
requirements; Natural light; Solar radiation

56 NAL Call. No.: QR1.F44
Production and regeneration of spheroplasts from the
cyanobacterium *Spirulina platensis*.
Lanfaloni, L.; Grifantini, R.; Petris, A.; Gualerzi, C.O.
Amsterdam : Elsevier Science Publishers; 1989 May.
FEMS microbiology letters - Federation of European
Microbiological Societies v. 59 (1/2): p. 141-146. ill; 1989 May.
Includes references.

Language: English

Descriptors: Saprospira; Regeneration; Growth rate; Genetic
engineering

57 NAL Call. No.: TP248.65.L57W67 1987
Production of eicosapentaenoic and arachidonic acids by the red
alga *Porphyridium cruentum*.
Cohen, Z.
Champaign, Ill. American Oil Chemists' Society; 1988.
Proceedings : World Conference on Biotechnology for the Fats and
Oils Industry / edited by Thomas H. Applewhite. p. 285-287; 1988.
Includes references.

Language: English

Descriptors: Eicosapentaenoic acid; Arachidonic acid; Algae

58 NAL Call. No.: S494.5.B563I5 1988
Production of food, feed, biochemical and bioenergy from
microalgae. Venkataraman, L.V.; Becker, E.W.
Paris, France : Societe francaise de microbiologie; 1988.
Proceedings : 8th International Biotechnology Symposium, Paris
1988 / edited by G. Durand, L. Bobichon, J. Florent. p. 910-922;
1988. Includes references.

Language: English

Descriptors: Algae; Algae culture; Cultured products; Production;
Industrial applications; Biotechnology

59 NAL Call. No.: QR1.F44
Production of gamma-linolenic acid from the marine green alga

Chlorella sp. NKG 042401.

Miura, Y.; Sode, K.; Nakamura, N.; Matsunaga, N.; Matsunaga, T.
Amsterdam : Elsevier Science Publishers; 1993 Mar01.

FEMS microbiology letters - Federation of European
Microbiological Societies v. 107 (2/3): p. 163-168; 1993 Mar01.
Includes references.

Language: English

Descriptors: Chlorella; Linolenic acid; Productivity; Yields;
Growth; Salinity; Nitrogen; Environmental factors; Industrial
applications

Abstract: gamma-Linolenic acid (GLA) production using a high GLA
producing marine green alga, Chlorella sp. NKG 042401, was
studied. GLA was presented in the galactolipid fraction
(37.9%/total fatty acids). The effects of growth conditions on
GLA production were studied. Optimum salinity for GLA production
was 5 g l⁻¹, at which salinity the highest cell concentration was
achieved, resulting in a 1.6-fold increase in GLA productivity.
Total fatty acid, however, was not drastically affected by change
of salinity. Nitrogen starvation decreased the ratio of
unsaturated fatty acids, and consequently GLA ratio in total
fatty acid decreased. The urea adduct method was used to
concentrate GLA from crude extract. As a result, after 5
sequential concentration procedures, GLA was concentrated 5-fold
with a yield of 49%.

60

NAL Call. No.: QD415.A1J62

Production of methyl ester fuel from Microalgae.

Nagle, N.; Lemke, P.

Totowa, N.J. : Humana Press; 1990.

Applied biochemistry and biotechnology v. 24/25: p. 355-361;
1990. Includes references.

Language: English

Descriptors: Algae; Lipids; Extraction; Fatty acid esters;
Biological production

61

NAL Call. No.: 307.8 J82

The production potential of eicosapentaenoic and arachidonic
acids by the red alga Porphyridium cruentum.

Cohen, Z.

Champaign, Ill. : The Society; 1990 Dec.

Journal of the American Oil Chemists' Society v. 67 (12): p.
916-920; 1990 Dec. Includes references.

Language: English

Descriptors: Rhodophyta; Strains; Eicosapentaenoic acid;
Arachidonic acid; Chemical composition; Algal cultures; Growth

62

NAL Call. No.: 450 P697

Results of a large scale screen of microalgae for the production of protease inhibitors.

Cannell, R.J.P.; Kellam, S.J.; Owsianka, A.M.; Walker, J.M.
Stuttgart, W. Ger. : Georg Thieme Verlag; 1988 Feb.
Planta medica v. 54 (1): p. 10-14; 1988 Feb. Includes references.

Language: English

Descriptors: Algae; Protease inhibitors; Antineoplastic agents; Medicinal properties

63

NAL Call. No.: SH388.75.R67 1991

Rotifer and microalgae culture systems proceedings of a U.S.-Asia workshop, Honolulu, Hawaii, January 28-31, 1991.

Fulks, Wendy; Main, Kevin L.

United States, National Oceanic and Atmospheric Administration
Honolulu, Hawaii : Oceanic Institute,; 1991.

xi, 364 p. : ill. ; 28 cm. Sponsored by the National Oceanic and Atmospheric Administration, United States Department of Commerce. Includes bibliographical references.

Language: English

Descriptors: Algae culture; Rotifera

64

NAL Call. No.: 391.8 F73

The safety evaluation of *Dunaliella bardawil* as a potential food supplement. Mokady, S.; Abramovici, A.; Cogan, U.

Exeter : Pergamon Press; 1989.

Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association v. 27 (4): p. 221-226; 1989. Includes references.

Language: English

Descriptors: *Dunaliella*; Food supplements; Food safety; Mutagenicity; Biochemistry; Food consumption; Adverse effects; Rats

65

NAL Call. No.: TP248.27.A46S62 1987

Scaling up a tubular photoreactor for continuous culture of *Porphyridium cruentum* from laboratory to pilot plant (1981-1987).

Chaumont, D.; Thepenier, C.; Gudin, C.; Junjas, C.

London : Elsevier Applied Science; 1988.

Algal biotechnology / edited by T. Stadler ... [et al.].. p. 199-208. ill; 1988. Proceedings of the 4th International Meeting, September 15-17, 1987, Villeneuve-d'Ascq, France. Includes references.

Language: English

Descriptors: France; Algae culture; In vitro; Tubes; Growth chambers; Continuous cropping; Layout and planning; Urea; Aseptic

state; Ph; Biomass; Production costs

66

NAL Call. No.: QK1.R4

Sea water used for the culture of alga *Spirulina platensis*.
Popovici, G.; Boldor, O.; Toma, T.; Nicola, N.; Titu, H.
Bucuresti : Editura Academiei Republicii Socialiste Romania; 1986
Jul. Revue roumaine de biologie. Serie de biologie vegetale v. 31
(2): p. 131-136. ill., plates; 1986 Jul. Includes references.

Language: English

Descriptors: Saprospira; Algae culture; Growth; Growing media;
Sea water

67

NAL Call. No.: QR1.M562

Strain selection for beta-carotene production by *Dunaliella*.
Markovits, A.; Gianelli, M.P.; Conejeros, R.; Erazo, S.
Oxford, OX, UK : Published by Rapid Communications of Oxford Ltd
in association with UNESCO and in collaboration with the
International Union of Microbiological Societies, c1990-; 1993
Sep.
World journal of microbiology & biotechnology v. 9 (5): p.
534-537; 1993 Sep. Includes references.

Language: English

Descriptors: *Dunaliella*; Strains; Growth rate; Beta-carotene;
Nitrates; Yields

68

NAL Call. No.: 381 J8224

A study of the energetics and economics of microalgal mass
culture with the marine chlorophyte *Tetraselmis suecica*:
implications for use of power plant stack gases.
Laws, E.A.; Berning, J.L.
New York, N.Y. : John Wiley & Sons; 1991 Apr25.
Biotechnology and bioengineering v. 37 (10): p. 936-947; 1991
Apr25. Includes references.

Language: English

Descriptors: Algae; Biomass

Abstract: The marine phytoplankter *Tetraselmis suecica* was grown
in shallow outdoor flumes for a period of approximately 6 months
at the Natural Energy Laboratory of Hawaii. In full sunlight,
gross production rates were 15-20 g C m⁻² d⁻¹. The
corresponding photosynthetic efficiencies (PE's) were 9-10%.
Respiration losses removed about half the gross production. The
CO₂ Utilization efficiencies of 96 +/- 11% were achieved by
bubbling CO₂ into the culture with the use of a counterflow sump
system. Adding the CO₂ in the form of carbonated water resulted
in utilization efficiencies of 81 +/- 11%. Archimedes screws
proved superior to both paddle wheels and propellers as a means
of circulating the water in the flumes. Insertion of foil arrays

into the flumes to effect systematic mixing of the culture significantly enhanced production. The enhancement was greater when the foils were oriented at a small angle relative to the horizontal than when they were oriented at the same angle relative to the vertical. Light modulation effects are implicated as the probable cause of most of the enhancement. Substitution of electric power plant stack gases for pure CO₂ resulted in no significant change in the production of *T. suecica* grown in chemostat culture.

69 NAL Call. No.: TD930.A32
Suitability of *Chlorella vulgaris* UAM 101 for heterotrophic biomass production.
Orus, M.I.; Marco, E.; Martinez, F.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 179-184; 1991. Includes references.

Language: English

Descriptors: *Chlorella vulgaris*; Algal cultures; Biomass production; Dry matter; Culture media; Glucose; Effects; Mitochondria; Respiration rate; Nitrates; Uptake; Simulation models; Growth models; Photosynthesis; Oxygen; Emission; Cells; Protein content

70 NAL Call. No.: TD930.A32
Temperature as an important factor affecting productivity and night biomass loss in *Spirulina platensis* grown outdoors in tubular photobioreactors. Torzillo, G.; Sacchi, A.; Materassi, R.
Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 95-100; 1991. Includes references.

Language: English

Descriptors: Italy; *Spirulina*; Biomass production; Temperature; Effects; Productivity; Dark; Losses; Bioreactors; Carbohydrates; Synthesis; Protein synthesis

71 NAL Call. No.: SF5.A8 1990
True availabilities of amino acids in soybean meal, fish meal, meat and bone meal, feather meal and spirulina meal determined with rooster. Hsu, A.; Lee, M.L.; Lu, J.J.; Lin, Y.F.
Chunan, Miaoli, Taiwan : The Organization Committee, Fifth AAAP Animal Science Congress; 1990.
Proceedings, the 5th AAAP Animal Science Congress, May 27-June 1, 1990, Taipei, Taiwan, Republic of China. v. 3 p. 100; 1990.
Includes references.

Language: English

Descriptors: Feeds; Protein; Amino acids; Fowls

72

NAL Call. No.: 47.8 B77

Use of the beta-carotene rich alga *Dunaliella bardawil* as a source of retinol. Ben-Amotz, A.; Edelstein, S.; Avron, M. Oxfordshire : Carfax Publishing Company; 1986 Dec. British poultry science v. 27 (4): p. 613-619; 1986 Dec. Includes references.

Language: English

Descriptors: Chicks; Diets; *Dunaliella*; Beta-carotene; Retinol; Body weight; Egg yolk color; Lutein

73

NAL Call. No.: 442.8 AN72

Use of the cell wall-less alga *Dunaliella bioculata* in herbicide screening tests. Felix, H.R.; Chollet, R.; Harr, J. Warwick : Association of Applied Biologists; 1988 Aug. Annals of applied biology v. 113 (1): p. 55-60; 1988 Aug. Includes references.

Language: English

Descriptors: *Dunaliella*; Herbicides; Herbicidal properties; Screening tests; Growth rate; Phytotoxicity

74

NAL Call. No.: QR1.R4

Utilizacao de sub-produtos da industria alcooleira na obtencao de biomassa de *Spirulina maxima*. II. Emprego do residuo da destilacao do mosto fermentado (Vinhaca) [Utilization of by-products from alcoholic fermentation industry to biomass production of *Spirulina maxima*. II. Use of molasses alcohol distillate waste]. Ferraz, C.A.M.; Aquarone, E.; Krauter, M.; Balloni, W.; Florenzano, G. Sao Paulo, Brazil : Sociedade Brasileira de Microbiologia; 1986 Jan. Revista de microbiologia v. 17 (1): p. 15-21. ill; 1986 Jan. Includes 17 references.

Language: Portuguese

Descriptors: *Saprospira*; Biomass accumulation; Molasses; Vinasse; Fermentation; Ethanol; Production

75

NAL Call. No.: TX341.P53

Utilization of beta-carotene from *Spirulina platensis* by rats. Kapoor, R.; Mehta, U. Dordrecht : Kluwer Academic; 1993 Jan. Plant foods for human nutrition v. 43 (1): p. 1-7; 1993 Jan. Includes references.

Language: English

Descriptors: *Spirulina*; Beta-carotene; Bioavailability; Rats

76

NAL Call. No.: QP501.C6

Variations in amino acid composition of phytoplanktonic production in sewage treatment ponds at Meze. Effects on the valorization of microalgal biomass. Lautier, J.; Maleville, A.; Cousse, H.; Mouzin, G.; Lagarrigue, J. Oxford : Pergamon Press; 1993 Apr.

Comparative biochemistry and physiology : B : Comparative biochemistry v. 104 (4): p. 775-779; 1993 Apr. Includes references.

Language: English

Descriptors: France; Sewage; Waste water treatment; Ponds; Phytoplankton; Biological production; Algae; Biomass; Amino acids; Composition

Abstract: 1. The amino acid composition of phytoplankton of sewage treatment ponds at Meze evolves with taxonomic origins of the population, growing conditions and sample time. 2. It is characterized by the presence of aliphatic compounds and amino diacids, and also by the weak representation of sulphur amino acids. 3. Chlorophyceae populations which present the highest concentration of amino acids could be used in aquaculture for the larval growth of molluscs. 4. Equally, with Bacillaryophyceae populations, they should represent a major constituent of the feeding of young mammals given their wealth of essential amino acids. 5. Production of Cyanophyceae could eventually be of value for dermocosmetology since they contain ornithin, precursor of growth factors.

77

NAL Call. No.: QP501.C6

Variations in fatty acid composition of phytoplanktonic production in sewage treatment ponds at Meze. Effects on the valorization of microalgal biomass. Lautier, J.; Maleville, A.; Cousse, H.; Mouzin, G.; Lagarrigue, J. Oxford : Pergamon Press; 1993 Apr.

Comparative biochemistry and physiology : B : Comparative biochemistry v. 104 (4): p. 769-773; 1993 Apr. Includes references.

Language: English

Descriptors: France; Sewage; Waste water treatment; Ponds; Phytoplankton; Fatty acids; Composition; Biological production; Algae; Biomass

Abstract: 1. Fatty acids composition of phytoplankton in sewage treatment ponds of Meze evolves over time with taxonomic origins of the population. 2. The major types seen in the course of an annual cycle are differentiated by the unsaturation level of their total fatty acids. 3. This level is high for Bacillaryophyceae, lower for Cyanophyceae, between the two preceding levels for chlorophyceae. 4. Only the fractions rich in polyunsaturated fatty acids can represent an essential constituent of feeding regime in aquaculture. 5. Due to the

presence of short-sequenced saturated fatty acids, reputed to be skin irritants, liposoluble extracts of the phytoplankton represent only a limited interest for cosmetic trade.

78 NAL Call. No.: TD930.A32
A vertical alveolar panel (VAP) for outdoor mass cultivation of microalgae and cyanobacteria.
Tredici, M.R.; Carlozzi, P.; Zittelli, G.C.; Materassi, R. Essex : Elsevier Applied Science Publishers; 1991.
Bioresource technology v. 38 (2/3): p. 153-159; 1991. Includes references.

Language: English

Descriptors: Italy; Anabaena azollae; Spirulina; Algae culture; Mass; Cultivation; Biomass production; Techniques; Bioreactors

79 NAL Call. No.: QR53.B56
Vertical tubular reactor for microalgae cultivation.
Miyamoto, K.; Wable, O.; Benemann, J.R.
Kew : Science and Technology Letters; 1988 Oct.
Biotechnology letters v. 10 (10): p. 703-708; 1988 Oct. Includes references.

Language: English

Descriptors: Algae; Cultivation; Color; Food supplements; Oxygen

80 NAL Call. No.: QR53.J68
Vitamin content of four marine microalgae. Potential use as source of vitamins in nutrition.
Fabregas, J.; Herrero, C.
Amsterdam : Elsevier Science Publishers on behalf of the Society for Industrial Microbiology; 1990 Jun.
Journal of industrial microbiology v. 5 (4): p. 259-264; 1990 Jun. Includes references.

Language: English

Descriptors: Algae; Sea water; Vitamins; Nutritional requirements; Food supplements

81 NAL Call. No.: R856.A1A32
Zur mixotrophen Kultivierung von Chlorella vulgaris in homokontinuierlicher Chemostatkultur [Mixotrophic cultivation of Chlorella vulgaris in homocontinuous cultivation in a chemostat].
Roth, P.; Burger, S.
Berlin, E. Ger. : Akademie-Verlag; 1987.
Acta biotechnologica v. 7 (1): p. 17-21; 1987. Includes references.

Language: German

Descriptors: *Chlorella vulgaris*; Cultivation methods; Cell culture; Protein content; Lipids; Carbohydrates; Nucleic acids; Phototropism

=====
Author Index

Abramovici, A. 63
Ahmed, A.M. 25
Amrith Kumar, M.N. 38
Anderson, D. 33
Aquarone, E. 74
Arad (Malis), S. 53
Arad, S.M. 46
Avron, M. 9, 10, 72
Avron, Mordhay 19
Ayala, F. 12
Balloni, W. 74
Barclay, W. 18
Becker, E.W. 57
Ben-Amotz, A. 9, 10, 72
Ben-Amotz, Ami, 19
Benemann, J.R. 7, 40, 79
Bernard, A. 41
Berning, J.L. 68
Bhaskar, B.V. 38
Boldor, O. 65
Borowitzka, Lesley J. 43
Borowitzka, Michael A. 43
Borysova, O.V. 66
Brown, L.M. 24
Burger, S. 81
Cannell, R.J.P. 61
Cardenas, A. 12
Carlozzi, P. 78
Casadevall, E. 34
Changoiwala, M. 32
Chatterjee, P. 32
Chaumont, D. 11, 37, 64
Cheng, L. 18
Chiba, Japan 30
Chollet, R. 73
Cogan, U. 63
Cohen, Z. 56, 60
Conejeros, R. 67
Cousse, H. 76, 77
Cysewski, G. 33
Dale, G. 21
Day, J.D. 17
De la Noue, J. 29
De La Noue, J. 52
Doucha, J. 20
Dubinsky, Z. 2
Duerr, E.O. 6
Dunahay, T.G. 24

Edelstein, S. 72
Edwards, A.P. 17
Erazo, S. 67
Fabregas, J. 80
Felix, H.R. 73
Fenwick, M.G. 45
Fernandes, H.L. 8
Ferraz, C.A.M. 74
Fialho, A.M. 8
Florenzano, G. 74
Fox, R.D. 47
Fox, Ripley D. 1
Friese, D.D. 42
Fulks, Wendy 62
Gianelli, M.P. 67
Grifantini, R. 55
Grizeau, D. 26
Gross, R. 48
Gross, U. 48
Gualerzi, C.O. 55
Gudin, C. 11, 37, 64
Gunnarsson, K. 35
Guy, R. 51
Haigh, G. 33
Harr, J. 73
Harris, P.O. 4
Hegewald, E. 27
Herrero, C. 80
Hirano, M. 23, 30
Hsu, A. 71
Ikuta, Y. 28
Iqbal, M. 5
Ishikawa-Doi, N. 30
Jarvis, E.E. 24
Jeanfils, J. 15
Jonasson, P.M. 35
Jonsson, G.S. 35
Junjas, C. 64
Kairesalo, T. 35
Kapoor, R. 75
Karuna-Karan, A. 33
Kay, R.A. 39
Kellam, S.J. 61
Kneifel, H. 27
Knutsen, G. 44
Kohlhase, M. 50
Krauter, M. 74
Kyle, D. 36
Lagarrigue, J. 76, 77
Lanfalconi, L. 55
Largeau, C. 34
Lautier, J. 76, 77
Laws, E.A. 68
LeDuy, A. 16
Lee, M.L. 71
Lemke, P. 59
Lewin, R.A. 18

Li, S.H. 14
Lin, Y.F. 71
Liu, W. 3
Lu, J.J. 71
Lupi, F.M. 8
Lustigman, B. 21
Main, Kevin L. 62
Makita, T. 28
Maleville, A. 76, 77
Mallick, N. 31
Manabe, E. 30
Marco, E. 69
Mares, P. 20
Markovits, A. 67
Martin, M. 50
Martinez, F. 69
Materassi, R. 70, 78
Matsunaga, N. 58
Matsunaga, T. 23, 30, 58
Matsunga, N. 23
McCormick, J.M. 21
McLaughlin, J.J.A. 21
Mehta, U. 75
Metting, B. 44
Metzger, P. 34
Miura, Y. 23, 58
Miyamoto, K. 79
Mokady, S. 63
Mori, H. 23
Mouzin, G. 76, 77
Nagle, N. 59
Nakamura, N. 23, 58
Navarro, J.M. 26
Negoro, M. 28
Nester, E. 33
Ni Eidhin, D. 29
Nicola, N. 65
Novais, J.M. 8
Orus, M.I. 69
Owsianka, A.M. 61
Papuzzo, T. 49
Pauw, N. de 52
Petris, A. 55
Podojil, M. 20
Pohl, P. 50
Popovici, G. 65
Qu, W. 3
Rai, L.C. 31
Ramelow, G.J. 4
Rezanka, T. 20
Richmond, A. 54
Richmond, Amos 13
Rodgers, G.A. 17
Roessler, P.G. 24
Roth, P. 81
Roth-Bejerano, N. 53
Sa-Correia, I. 8

Sacchi, A. 70
Sampath, S.R. 38
Samson, R. 16
Schlipalius, L. 22
Schoeneberger, H. 48
Shaish, A. 9
Shioji, N. 28
Sivan, A. 53
Sode, K. 30, 58
Soeder, C.J. 27
Sundareshan, K. 38
Takano, H. 30
Tapie, P. 41
Thepenier, C. 37, 64
Thomas, D. 15
Tillett, D.M. 40
Titu, H. 65
Toma, T. 65
Tomaselli, L. 49
Tome, M.M. 8
Torzillo, G. 70
Tredici, M.R. 49, 78
Tseng, C.K. 3
Uchiumi, M. 28
United States, National Oceanic and Atmospheric Administration 62
Van Moppes, D. 53
Vargas, T. 12
Venkataraman, L.V. 57
Vonshak, A. 51
Wable, O. 79
Walker, J.M. 61
Weissman, J.C. 40
Wilde, E.W. 7
Wyman, C. 18
Yang, P.Y. 6
Zafar, S.I. 5
Zeiler, K.G. 24
Zhou, B. 3
Zidan, M.A. 25
Zittelli, G.C. 78

=====
Subject Index

Acetyl-coa carboxylase 24
Adsorption 4
Adverse effects 63
Agitation 47
Air pollution 28
Aldehydes 34
Algae 2, 7, 8, 11, 20, 23, 34, 36, 39, 41, 43, 44, 46, 52, 53,
56, 57, 59, 61, 68, 76, 77, 79, 80
Algae as food 1
Algae culture 1, 6, 9, 10, 11, 12, 13, 14, 17, 18, 22, 33, 36,
37, 39, 40, 43, 47, 50, 51, 52, 54, 57, 62, 64, 65, 78
Algae meal 38
Algae products 43

Algal cultures 60, 69
Algal protein 22
Alginates 26, 31
Allium cepa 32
Amino acids 71, 76
Ammonium chloride 30
Anabaena azollae 78
Anabaena doliolum 31
Anaerobic conditions 16
Anaerobic digesters 16
Anaerobic treatment 6
Antineoplastic agents 61
Aquaculture 3
Aquatic communities 66
Arachidonic acid 56, 60
Arid lands 44
Aseptic state 50, 64
Assimilation 15
Bacillariophyta 28
Bacteria 66
Benthos 35
Beta-carotene 9, 22, 33, 67, 72, 75
Binding 4
Bioavailability 75
Biochemistry 63
Biological production 23, 59, 76, 77
Biological treatment 28
Biomass 4, 29, 64, 68, 76, 77
Biomass accumulation 16, 35, 74
Biomass determination 49
Biomass production 11, 44, 69, 70, 78
Bioreactors 11, 70, 78
Biosynthesis 8, 9, 34
Biotechnology 2, 10, 33, 34, 40, 41, 52, 57
Body weight 72
Calves 38
Carbohydrate metabolism 5
Carbohydrates 70, 81
Carbon dioxide 28
Carboxy-lyases 24
Carotenoids 34
Cash crops 33
Cations 31
Cell culture 28, 81
Cell division 53
Cell walls 34, 53
Cells 11, 69
Chemical composition 52, 60
Chicks 72
Chile 12
China 14
Chlorella 27, 58
Chlorella ellipsoidea 24
Chlorella vulgaris 4, 31, 69, 81
Chlorophyta 24, 28
Cochliomyia hominivorax 42
Color 79

Commercial farming 39
Composition 76, 77
Computer applications 50
Continuous cropping 64
Copper 21
Cosmetics 46
Cost benefit analysis 47
Crude proteins 38
Crusts 44
Crystallization 22
Cultivation 8, 9, 20, 78, 79
Cultivation methods 81
Culture filtrates 32
Culture media 28, 29, 49, 69
Cultured products 57
Cyclotella 24
Damage 11
Dark 70
Degradation 53
Density 31
Deserts 44
Design requirements 54
Desorption 4
Developing countries 47
Diet 22, 42
Diet studies 38
Diets 72
Digestion 6
Direct DNAuptake 24
Drinking water 31
Dry feeds 17, 22
Dry matter 69
Dunaliella 9, 10, 12, 19, 21, 22, 25, 26, 63, 66, 67, 72, 73
Effects 69, 70
Egg yolk color 72
Eicosapentaenoic acid 56, 60
Electroporation 24
Emission 69
Energy content 39
Energy cost of production 39
Environment 2
Environmental factors 58
Enzymes 37, 53
Ethanol 74
Exhaust gases 28
Extraction 59
Extracts 53
Fatty acid esters 59
Fatty acids 30, 34, 77
Fauna 35
Feasibility studies 12
Federal programs 18
Feed crops 6
Feed evaluation 38
Feeding 3, 17, 38
Feeds 71
Fermentation 74

Fertilizer technology 33
Fluorescent dyes 33
Fluorescent light 50
Food biotechnology 9, 36
Food colorants 22, 46
Food composition tables 39
Food consumption 63
Food processing 39
Food safety 63
Food supplements 39, 63, 79, 80
Foods 46
Fowls 71
France 11, 64, 76, 77
Fruits 5
Fuel crops 18
Fuels 18
Gene expression 24
Gene transfer 24
Genetic engineering 52, 53, 55
Genetic improvement 53
Genetic transformation 24
Geochemistry 34
German federal republic 50
Glucose 69
Glycerol 9, 21, 25, 26
Growing media 65
Growth 9, 58, 60, 65
Growth chambers 50, 54, 64
Growth curve 53
Growth inhibitors 32
Growth models 69
Growth rate 38, 55, 67, 73
Gymnodinium 53
Handbooks, manuals, etc 13
Harvesting 52
Hatcheries 3
Heavy metals 7
Herbicidal properties 73
Herbicides 73
History 14
Hydrocarbons 34
Hydrodynamics 11
Immobilization 5, 15, 26, 31
In vitro 37, 50, 64
Industrial applications 36, 57, 58
Industrial methods 17, 22
Inhibitors 9, 51
Innovations 33
Ion uptake 4
Isomerization 9
Israel 51, 54
Italy 70, 78
Lakes 35
Land use 33
Layout and planning 12, 47, 50, 64
Light flux 20
Light intensity 9

Light regime 11
Linolenic acid 23, 30, 58
Lipids 59, 81
Lipogenesis 30, 34
Literature reviews 7, 34, 39
Liveweight gains 38
Losses 70
Luciferase 24
Luffa aegyptiaca 5
Lutein 72
Manures 6
Mass 9, 78
Mass rearing 42
Measurement 35
Meat meal 38
Medicinal properties 61
Metabolism 27, 35, 38
Metal ions 4
Metals 31
Methane production 16
Microorganisms 36
Mitochondria 69
Mitosis 32
Mixing 11
Modifications 37
Molasses 74
Mollusca 17
Mutagenicity 63
Naphthalene 27
Natural light 12, 51, 54
Nickel 28
Nitella 35
Nitrate reductase 24
Nitrates 67, 69
Nitrites 15
Nitrogen 49, 58
Nucleic acids 81
Nutrient availability 30
Nutrient content 39
Nutrient density 39
Nutrients 31
Nutritional requirements 80
Nutritional value 48, 52
Oils and fats industry 36
Operation 11
Optimization 11
Organic acids 31
Osmotic pressure 25
Osmotic pretreatment 53
Oxygen 69, 79
Ph 31, 49, 64
Photosynthesis 25, 28, 35, 40, 41, 51, 53, 69
Phototropism 81
Phytoene 9
Phytoplankton 76, 77
Phytotoxicity 73
Pig farming 6

Pigments 5, 33, 46
Plant analysis 48
Plant communities 35
Plant composition 2
Plant ecology 35
Plant morphology 45
Plant production 35
Plant products 10
Plant proteins 48
Plant tissues 5
Pollutants 4
Polymers 34
Polysaccharides 5, 8, 37
Ponds 51, 76, 77
Powders 17, 22
Production 21, 25, 26, 41, 53, 57, 74
Production costs 40, 64
Productivity 58, 70
Products 40
Protease inhibitors 61
Protein 71
Protein content 69, 81
Protein synthesis 70
Protoplasts 53
Public health engineering 47
Pumps 11
Rats 63, 75
Reclamation 44
Recycling 29
Regeneration 55
Reporter genes 24
Research policy 14
Research projects 14, 18
Resistance to injurious factors 51
Respiration rate 53, 69
Retinol 72
Rhodophyta 5, 60
Rotifera 62
Salinity 21, 58
Salt tolerance 9, 10
Saprospira 6, 12, 16, 32, 38, 47, 49, 51, 55, 65, 74
Scallops 3
Scenedesmus 15, 27, 29, 45, 48
Scenedesmus quadricauda 4
Screening tests 73
Sea water 65, 80
Seasonal growth 35
Sewage 76, 77
Shandong 3
Simulation models 69
Solar radiation 54
Sorption 7
South australia 22
Soybean oil 22
Species 11, 22, 53, 66
Spirulina 1, 3, 30, 42, 70, 75, 78
Sterols 34

Strain differences 51
Strains 60, 67
Stress 2
Stresses 11
Structural genes 24
Sulfur 27
Supplements 22
Synthesis 70
Taxonomy 45
Techniques 78
Temperature 70
Temperature relations 20
Temperatures 2
Total digestible nutrients 38
Toxicity 21
Triacylglycerols 34
Trials 17
Tubes 37, 64
U.S.A. 18
Uk 17
Unsaturated fatty acids 20
Uptake 15, 31, 69
Urea 64
Value added 33
Vanadium 28
Variations 45
Villages 47
Vinasse 74
Vitamins 80
Waste treatment 40
Waste water treatment 47, 76, 77
Water pollution 4, 7, 31
Water purification 4
Yields 58, 67

Return to:

Alternative Farming Systems Information Center, <http://afsic.nal.usda.gov>
National Agricultural Library, <http://www.nal.usda.gov>

United States Department of Agriculture
Agricultural Research Service
National Agricultural Library

The Alternative Farming Systems Information Center, afsic@nal.usda.gov
Web Policies and Important Links, <http://www.nal.usda.gov/web-policies-and-important-links>