

## A NEW SPECIES OF THE GENUS *CODIUM* (CHLOROPHYTA -CODIALES) FROM THE EASTERN COAST OF LIBYA

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### Abstract

A new alga, *Codium tobrukense* Nizamuddin & Fathalla sp. nov., and a new form, *C. tobrukense* f. *elmasirensense* Nizamuddin & Fathalla f. nov., are described from Tobruk in the eastern coast of Libya.

### Introduction

In the collection of marine algae from Tobruk, in the eastern coast of Libya, a new species belonging to the genus *Codium* Stackhouse was recognized which is designated as *Codium tobrukense* Nizamuddin & Fathalla sp. nov. Previously a single species, *C. tomentosum* (Huds.) Stackhouse was reported from Tobruk by Nizamuddin (1991).

### Materials and Methods

The material was collected by the second author in the month of January, 1991. The specimens were preserved in 4% formalin seawater solution for anatomical study and stained in KI<sub>2</sub> solution. The specimens mounted on herbarium sheets have been deposited in the Herbarium, Department of Botany, Garyounis University, Benghazi (CHUG nos. FM-650, 651).

### TAXONOMIC ENUMERATION

*Codium tobrukense* Nizamuddin & Fathalla sp. nov., Fig.1 & Fig.2. A,B: a,b.

**Holdfast:** conico-discoid up to 1 cm diam., with a short compressed stipe up to 3 mm high and 5 mm across; **Thallus** caespitose (up to 6 plants), erect up to 10 cm long, dichotomously branched (up to 13 orders); dichotomies at a distance of 1 cm or rarely less. Lower segments throughout terete up to 2 mm diam., upper segments slightly compressed up to 4 mm across and occasionally constricted; terminal segments short, terete up to 8 mm long and up to 2 mm diam, divaricate with broad ends; angle of dichotomies narrowly acute but occasionally broadly rounded; dichotomies compressed up to 5 mm across; interdichotomal distances variable i.e., 1-2 cm; distal end slightly proliferated. **Utricles** simple or branched cylindrical, ovate to pyriform, (i) from the tip (215-) 250-285 (-400)  $\mu$ m long, (50-) 85-150 (-240)  $\mu$ m diam; L/B (1.2-) 2-4.5 (-8) (ii) from the medial parts (312-) 400-600  $\mu$ m long, (75-) 100-250 (-312)  $\mu$ m diam; L/B (1.5-) 2.5-5 (-6.5) (iii) from the stipe, 255- 510 (-1020)  $\mu$ m long, 75-205 (-305)  $\mu$ m diam; L/B 1.3-5. Apical wall lamellate and up to 6  $\mu$ m thickened. Apices round, smooth or flat, narrowly prolonged. Hairs or hair scars rare, generally 2 per utricle, (35-) 60-125  $\mu$ m below the utricle apices. **Gametangia** pedicellate, papillate, ovate to fusiform, 4 per

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Fig.1. *Codium tobrukense* Nizamuddin et Fathalla sp. nov. Habit of the thallus. Holotype no.FM650

utricles, 150-190  $\mu\text{m}$  long, 35-75  $\mu\text{m}$  broad; L/B 2-4; 185-260 (-330)  $\mu\text{m}$  below the utricles apices. Medullary filaments 25-62  $\mu\text{m}$  diam.

Type locality: Tobruk, near Hotel El-Masira (Leg. Fathalla, 27-1- 1991, Holotype no. FM650 in CHUG).

The plant is dark green in living condition and was found to grow luxuriantly on old rusted barge in polluted bay on the back of the Hotel. The bay is polluted due to the inflow of sewage.

*Codium tobrukense* resembles *C. tomentosum* (Huds.) Stackh. and *C. vermilara* (Oliv) Delle Chiaje in pattern of branching but differs in general morphology, in tereto-compressed segments, short terminal segments, in the average L/B ratio, in apical utricles thickening, in utricles and gametangial size.

**Descriptio:** *Thallus* caespitosus (ad 6 plantae), erectus ad 10 cm alt., dichotome ramosus (ad tredecies), dichotomiis ad distantibus autem raro minus, rami in parte thalli inferiori plerumque teretibus ad 2 mm diam., rami in parte thalli supra paululum compressi ad 4 mm lat., autem rari constricti, ad dichotomiis complanati ad 5 mm lat. *Utriculi* simplici aut ramosi cylindrici, ovati-clavati aut pyriformes, (i) ab apice (215-) 250-285 (-400)  $\mu\text{m}$  alt., (50-) 85-150 (-240)  $\mu\text{m}$  lat.; A/L (1.2-) 2.4-5 (-8) (ii) ab medianum (312-) 400-600  $\mu\text{m}$  alt. (75-) 100-250 (-312)  $\mu\text{m}$  lat.; A/L (1.5-) 2.5-5 (-6.5); (iii) ab stipes, 255-510 (-1020)  $\mu\text{m}$  alt., 75-205 (-305)  $\mu\text{m}$  lat., A/L 1.3-5. Membrana utricularis ad apicem ad 6  $\mu\text{m}$  crassi, aut lamellata. Apicibus rotundatis, levis, complanatis aut anguste acutus. Pili (aut pilorum cicatrices) rari, plerumque 2 per utriculum, (35-)60-125  $\mu\text{m}$  infra utriculi apicem portata. *Gametangia*, apud mediam utriculorum affixis, pedicellata, ovata, lanceo-ovata aut fusiformia oblanceo-ovata, 150-190  $\mu\text{m}$  alt., 35-75  $\mu\text{m}$  lat.; A/L 2- 4, ad 4 per utriculum, ad 185-260 (-330)  $\mu\text{m}$  infra utriculi apices portata. Filamenta medullaria plerumque 25-62  $\mu\text{m}$  diam.

**Holotypus:** Tobruk, prope Hotel El-Masira (Leg. Fathalla. 27-1- 1991. no. FM650 in CHUG).

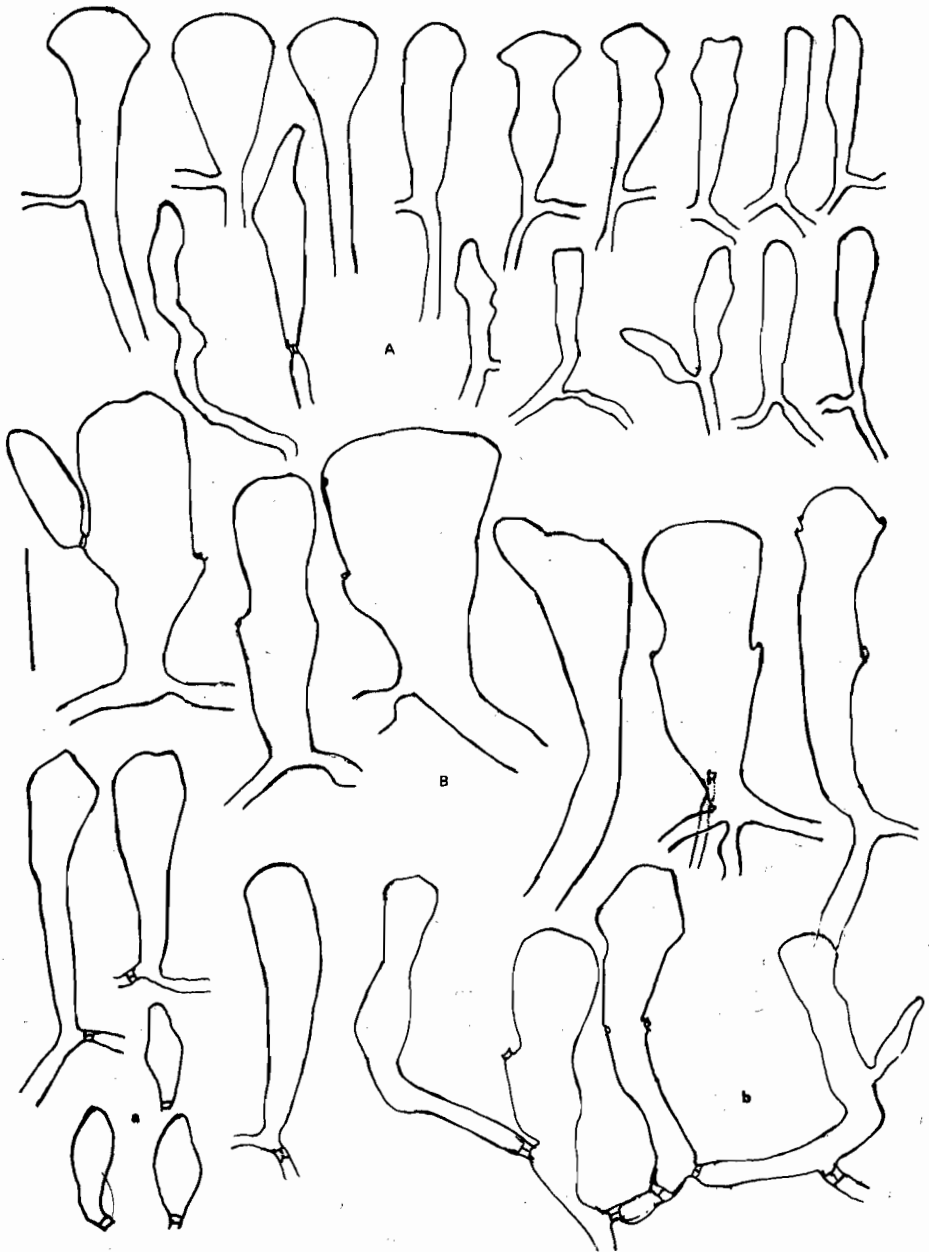


Fig.2. *Codium tobrukense* sp. nov.; Series of utricles: A. From the tip, B. From the medial part: a) 3 Gametangia, b) Branched utricles.



Fig.3. *Codium tobrukense* f. *elmasirensis* Nizamuddin et Fathalla f. nov.: Holotype no.FM651.

*Codium tobrukense* f. *elmasirensis* Nizamuddin & Fathalla f. nov. Fig.3 & Fig.4, A,B: a,b, Fig.5, A,B.

**Holdfast:** discoid up to 5 mm diam, with a short erect stipe up to 5 mm high, compressed upto 6 mm broad. **Thallus** erect upto 10 cm high, terete-compressed 3 mm diam., as well as 3 mm broad, dichotomously branched (8-12 orders). Segments terete-compressed up to 8 mm across, at intervals of 2 cm; distal segments terete upto 1 mm diam; dichotomies flat up to 8 mm broad; strongly proliferated; proliferations simple or dichotomous, congested, terete, radially arranged upto 1 mm diam., gradually becoming swollen or compressed up to 2 mm broad. **Utricles** cylindrical, clavate to pyriform, capitate (i) from the tip-260-500  $\mu\text{m}$  long, (35-) 75-125  $\mu\text{m}$  broad; L/B 2.4-8, (ii) from the medial parts 435-750  $\mu\text{m}$  long, 90-215  $\mu\text{m}$  broad; L/B 2-6 (iii) from the stipe 250-500  $\mu\text{m}$  long, 60-125 (- 190)  $\mu\text{m}$  broad; L/B 2.2 - 6. Apices round or flat, smooth. Apical wall 4.5-12  $\mu\text{m}$  thick and lamellate. Hairs or hair scars 2-4 borne at a distance of 35-75  $\mu\text{m}$  below the utricle apices. **Gametangia** pedicellate, papillate, fusiform, 125-165  $\mu\text{m}$  long, 50-75  $\mu\text{m}$  broad, 2-4 per utricle, at a distance of 215-275  $\mu\text{m}$  below the utricle apices. **Medullary** filaments 25-65  $\mu\text{m}$  diam.

**Type locality:** Tobruk, near Hotel El-Masira (Leg. Fathalla 27-1- 1991. Holotype no. FM651 in CHUG).

Grows in association of the type species in polluted bay on the old rusted barge on the back of the Hotel.

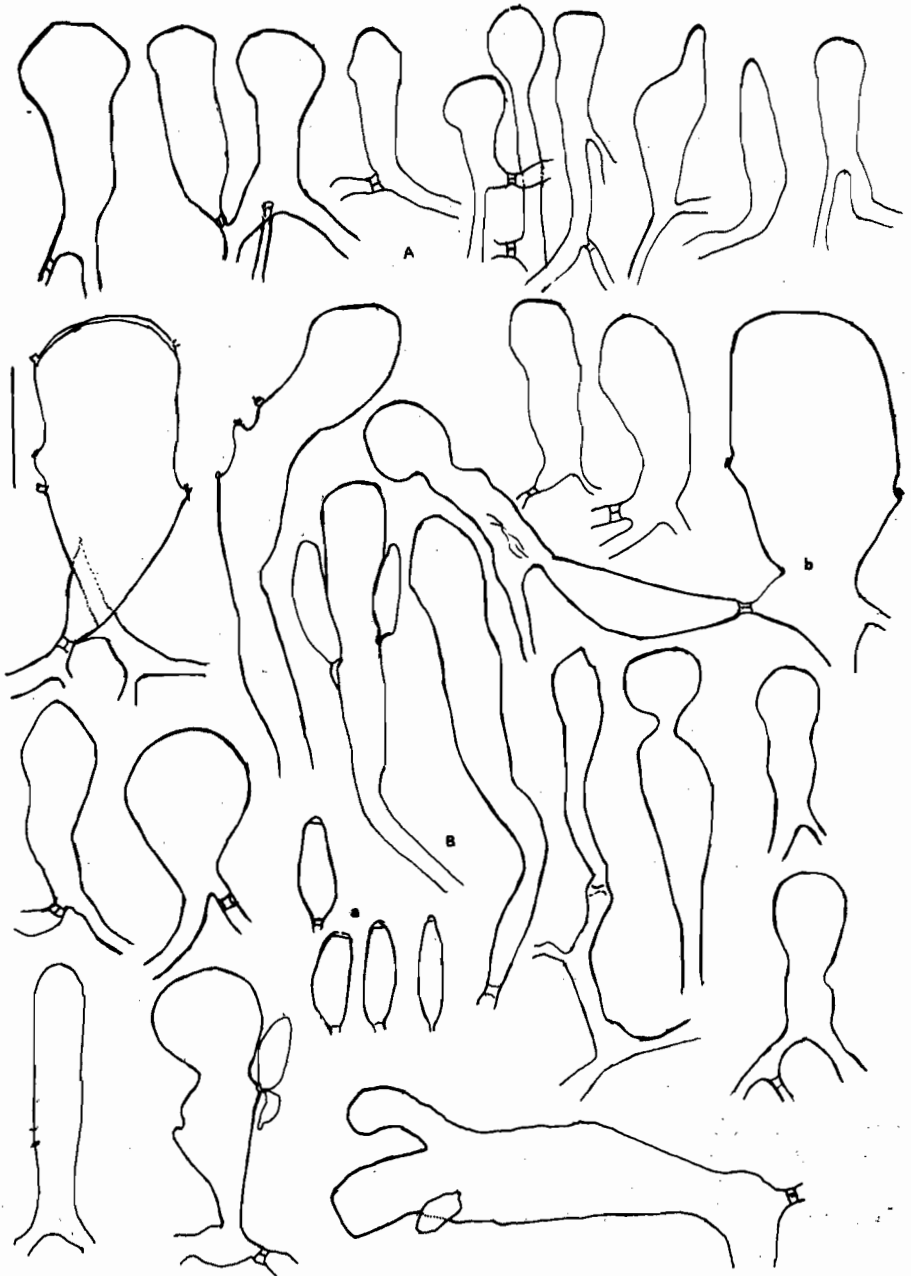


Fig.4. *Codium tobrukense* f. *elmasirensis* f. nov.; Series of utricles: A. From the tip, B. From the medial part.

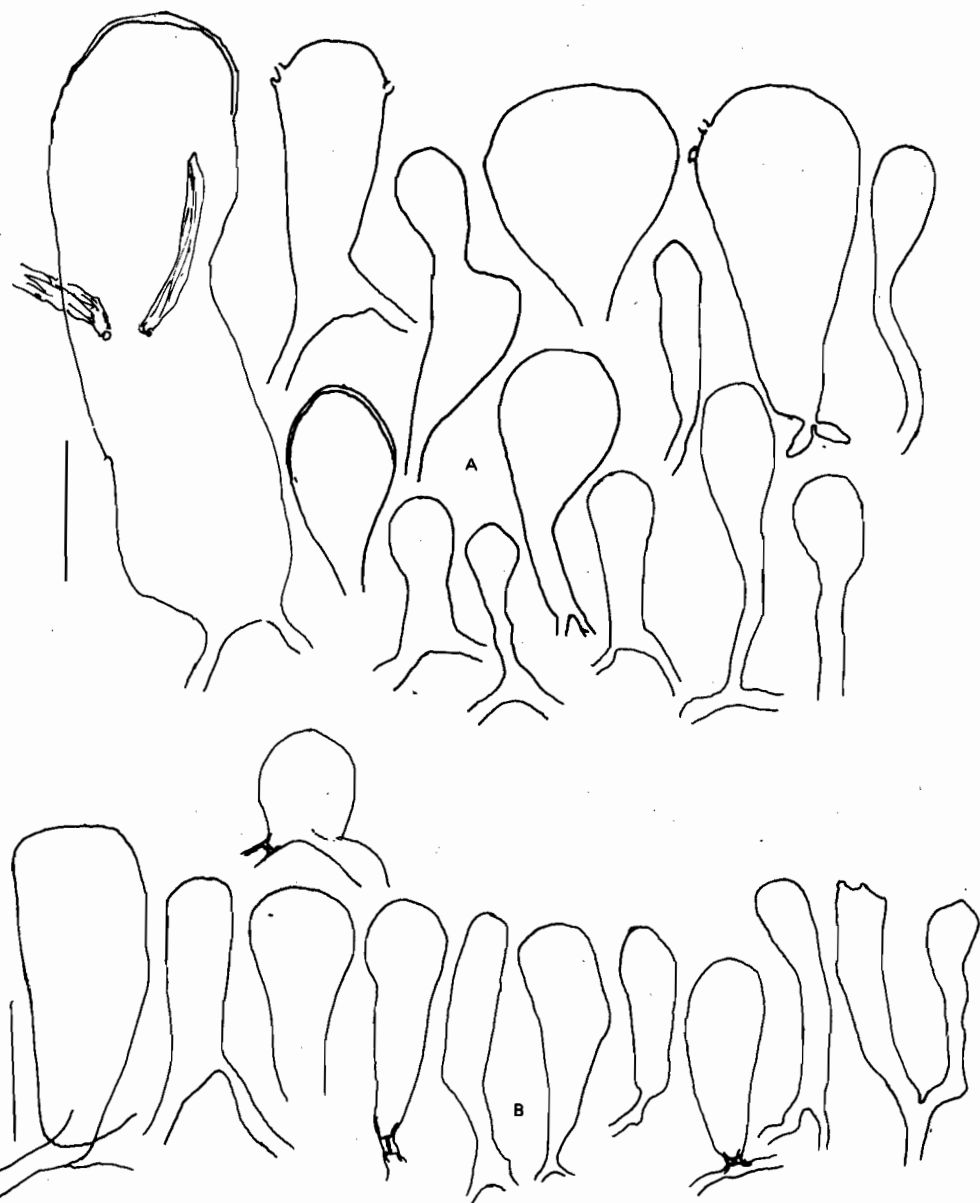


Fig.5. Series of utricles: A. From the stipe of *Codium tobrukense*, B. From the stipe of *Codium tobrukense* f. *elmasirensis*.

N.B. Scale bar = 200  $\mu$ m

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CHUG = Cyrenaica herbarium university of Garyounis.

This form resembles the type in habit but strongly differs in the arrangement of proliferations which are simple or dichotomously branched and radial.

**Discriptio:** *Thallus* erectus ad 10 cm alt., tereti-compressi ad 3 mm diam, dichotome ramosus (octavies-duodecimies). Segmenta tereto-compresso ad 8 mm diam., ad distance 2 cm; segmentis distalis teretis ad 1 mm diam; dichotomii complanati ad 8 mm lat. Prolificatio valde, congestis, arctis, simplex aut dichotome, radialiter disposita teretes ad 1 mm diam, gradatim inflati aut compressi ad 2 mm lat., Utriculi cylindrici, clavati aut pyriformes, infra apices capitulum formantes (i) ab apice 260-500  $\mu\text{m}$  alt., (35-) 75-125  $\mu\text{m}$  lat.; A/L 2.4-8 (ii) ab medial-435-750  $\mu\text{m}$  alt., 90-215  $\mu\text{m}$  lat; A/L 2-6 (iii) ab stipes 250-500  $\mu\text{m}$  alt., 60-125 (-190)  $\mu\text{m}$  lat.; A/L 2.2-6. Apicibus rotundatis, levis complanatis. Membrana utricularis lamellatis ad apices 4.5-12  $\mu\text{m}$  crassa. Pili (aut pilorum cicatricices) 2-4 per utriculum ad 35-75  $\mu\text{m}$  infra apicem. *Gametangia* pedicillatas, papillatas, fusiformia 125-165  $\mu\text{m}$  alt., 50-75  $\mu\text{m}$  lat., 2-4 per utriculum ad 215-275  $\mu\text{m}$  infra apicem. *Filamenta* medullaria 25-65  $\mu\text{m}$  diam.

**Holotypus:** Tobruk, prope Hotel El-Masira (Lag. Fathalla 27-1-1991 no. FM 651 in CHUG).

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#### Reference

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