

The Cochlostomatidae of Northern Africa (Gastropoda, Caenogastropoda)

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A comprehensive survey on the Cochlostomatidae from Northern Africa is given, based on a critical examination of the type specimens of the described nominal taxa. As a result, five species are accepted to occur in Northern Africa: *Cochlostoma letourneuxi* (Bourguignat, 1866) from Tunisia and Algeria, *C. atlanticum* (Bourguignat, 1868) from Algeria, *C. barcaense* Brandt, 1958 and *C. susaense* Brandt, 1958 from Libya and *Obscurella marocanum* (Pallary, 1928) from Morocco. New records of *C. letourneuxi* for Tunisia are provided. The shell of each species is described and illustrated, synonyms are listed, and a distribution map is provided. A lectotype is selected for *Pomatias letourneuxi*; *Pomatias tunetanus* is selected as type species for *Tunetana* A. J. Wagner, 1897.

INTRODUCTION

The terrestrial Gastropoda of Northern Africa is a group of invertebrate animals that is astonishingly poorly known. It is represented by 1,500 validly described taxa, at least, but much of the knowledge is exclusively based on shell morphology. In many cases the question whether a name represents an existing biological species is unresolved, and very often, the generic placement of a taxon is unknown. It will

be the future task to re-evaluate the current knowledge and amend it as much as possible with new data, new methods, and a sound revision of the hitherto described “species”. The overwhelming number of names was created by Bourguignat (1868; 1892), and Letourneux & Bourguignat (1887), and particularly the latter “Prodrome” is an extreme example for the over-proliferous production of names for which the “Nouvelle Ecole” has to take responsibility.

One of the more speciose families occurring in the area is the Cochlostomatidae, which is represented by 22 valid species-level names. The present paper aims to establish a revised list of cochlostomatids from Northern Africa based on the study of type specimens. Unfortunately, the live collected animals were not available for genetic investigation.

The system of names created by Bourguignat, Letourneux, Kobelt and others is quite complicated and hard to understand. In many cases it is almost impossible to verbalise the differences between the taxa created by these authors, particularly because there is no illustration given. Many of their “species” are based on a very few specimens only, and often occur syntopic: for example, Letourneux & Bourguignat (1887) found six “species” to live together on Djebel Recas, Tunisia (*Cochlostoma euneum*, *C. henoni*, *C. latasteanum*, *C. letourneuxi*, *C. monticola*, *C. punicum*), and four species on Djebel Zaghouan, Tunisia (*C. belloiri*, *C. cyclo-nixium*, *C. letourneuxi*, *C. tunetanus*).

MATERIAL AND METHODS

Specimens were collected by hand during field studies in Tunisia by I. Abbes and K.I. Ezzine between 2009 and 2018. Measurements were taken using the micrometer of the binocular microscope as well as a numerical caliper. Assess-

ments of the shell morphological characters were done by using a LEICA M212 stereo microscope. The shells were photographed with a LEICA DFC 425 camera combined with a LEICA M205 C. The multifocal images were processed by using imaging software (Imagic Switzerland).

Georeferencing the localities visited by Brandt is a major problem. Transliteration of Arabic names often enough follows the nationality of the author rather than a clear scheme. Additionally, names have changed, or today, roads follow another track than they used to 70 years ago. On top, Brandt diligently used local names of Wadis often without giving a hint to where it was located. For this reason, we also used his other papers focusing on the Cyrenaica and cross-checked place names (Brandt, 1956a; 1956b; 1959). This enables us to track down most of his localities, sometimes with an uncertainty of 5 to 10 km.

Key to abbreviations used: H = height; D = Diameter; PH = Peristome height; PD = Peristome diameter; MENK = collection H.P.M.G. Menkhorst, Krimpen aan den IJssel; MHNG-MOLL = Muséum d’Histoire Naturelle de Genève; NMBE = Natural History Museum Bern; SMF = Senckenberg Museum Forschungsinstitut, Frankfurt am Main.

The malacological collections of SMF, NMBE and MHNG were studied and referenced. Additional specimens were

collected by I. Abbes and I.K. Ezzine during the last 15 years. All localities are arranged following the geographic position of the governorates in an order from North to South and illustrated in Fig. 1. Ribs counts were taken from the penultimate whorl above the aperture.

SYSTEMATIC ACCOUNT

- Class Gastropoda Cuvier, 1795**
- Subclass Caenogastropoda Cox, 1960**
- Order Architaenioglossa Haller, 1892**
- Superfamily Cyclophoroidea J. E. Gray, 1847**
- Family Cochlostomatidae Kobelt, 1902**
- Genus *Obscurella* Clessin, 1889 & Genus *Cochlostoma* Jan, 1830**

***Obscurella marocana* (Pallary, 1928)**

Figs 1-3

Pomatias marocanus Pallary, 1928, J. de Conch., 72 (1): 15-16, pl. 2 figs 5-8 (shell). Type locality: “Dans les fentes de calcaire dur jurassique à Tizi r’Nim, à 1.523 mètres d’al-

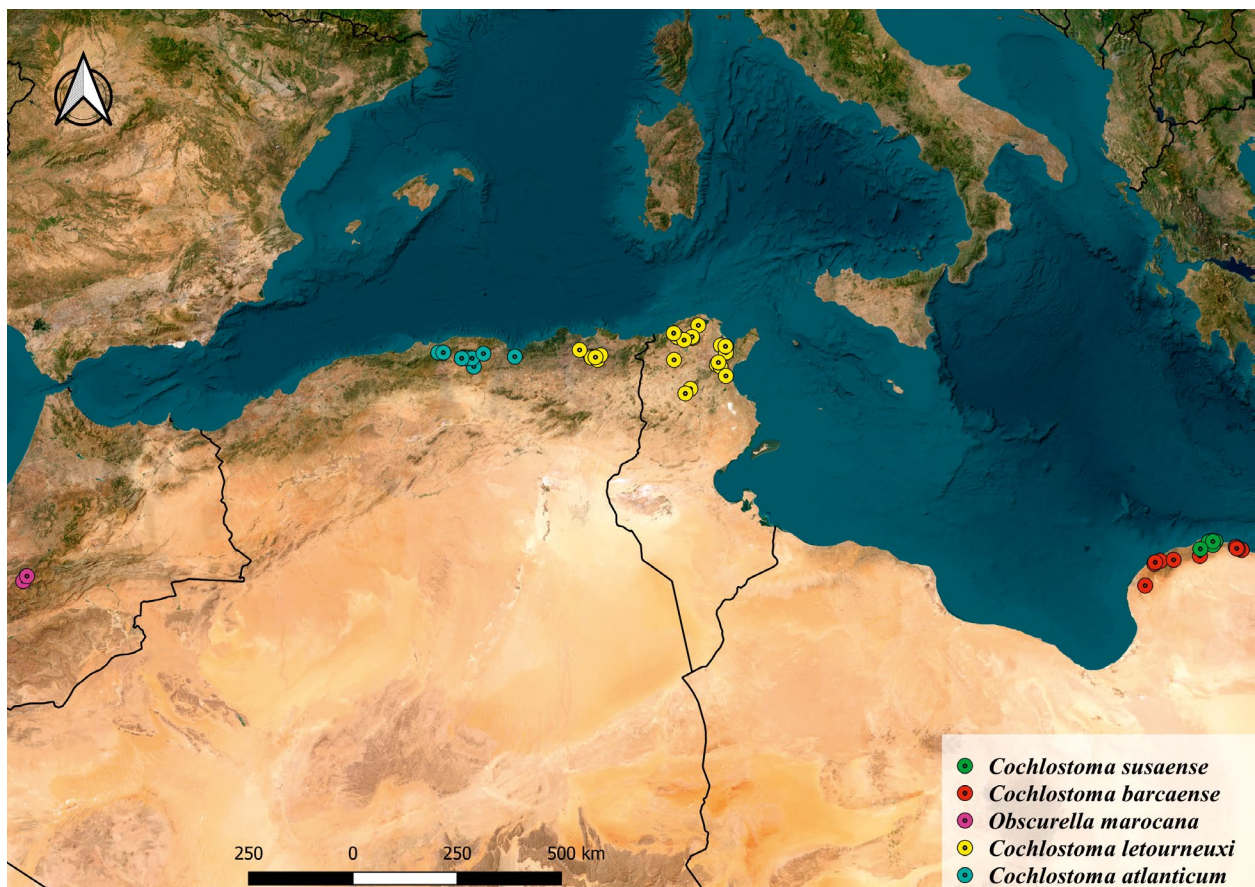
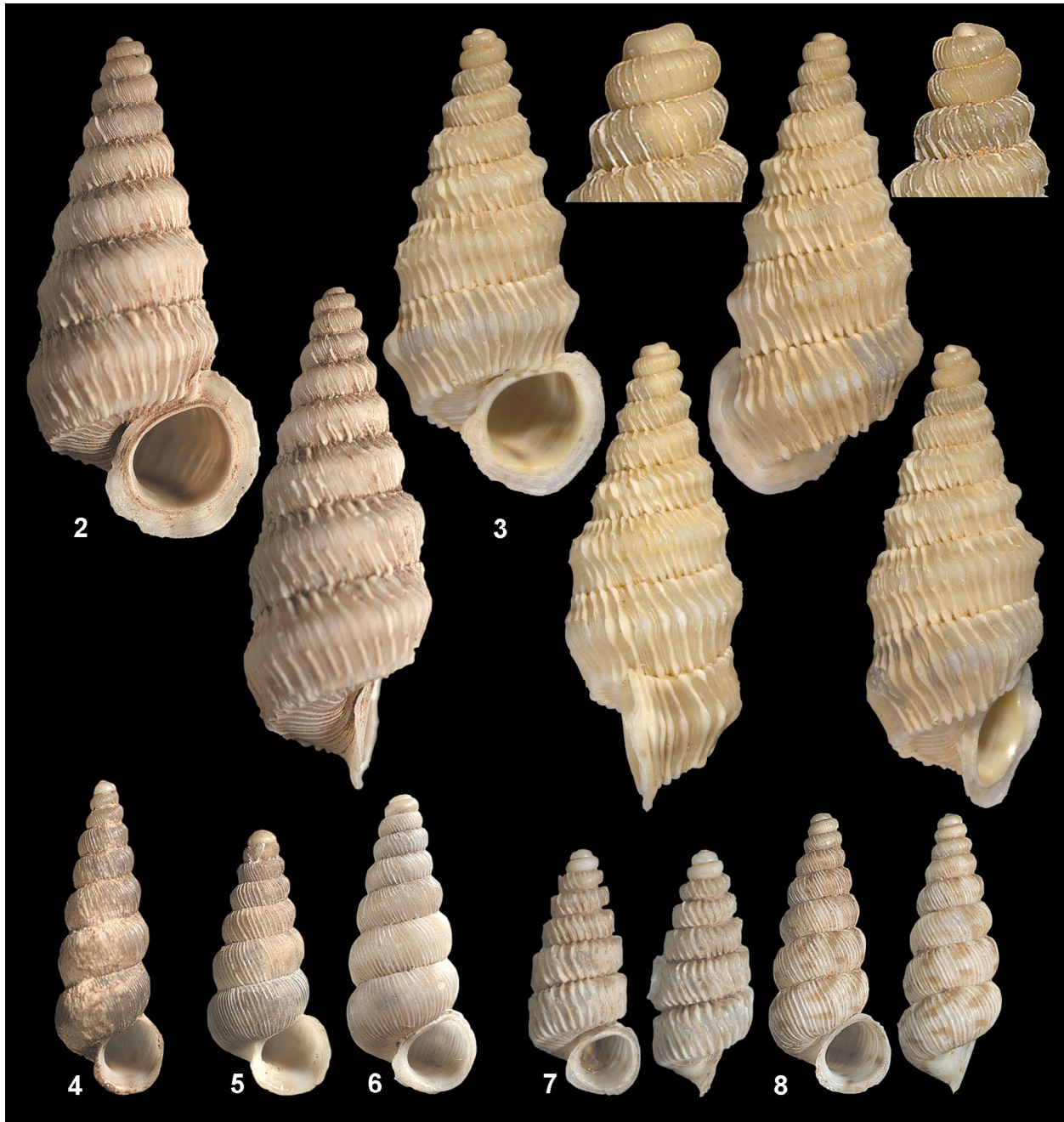


Fig. 1. Distribution map of the five Cochlostomidae species in Northern Africa.



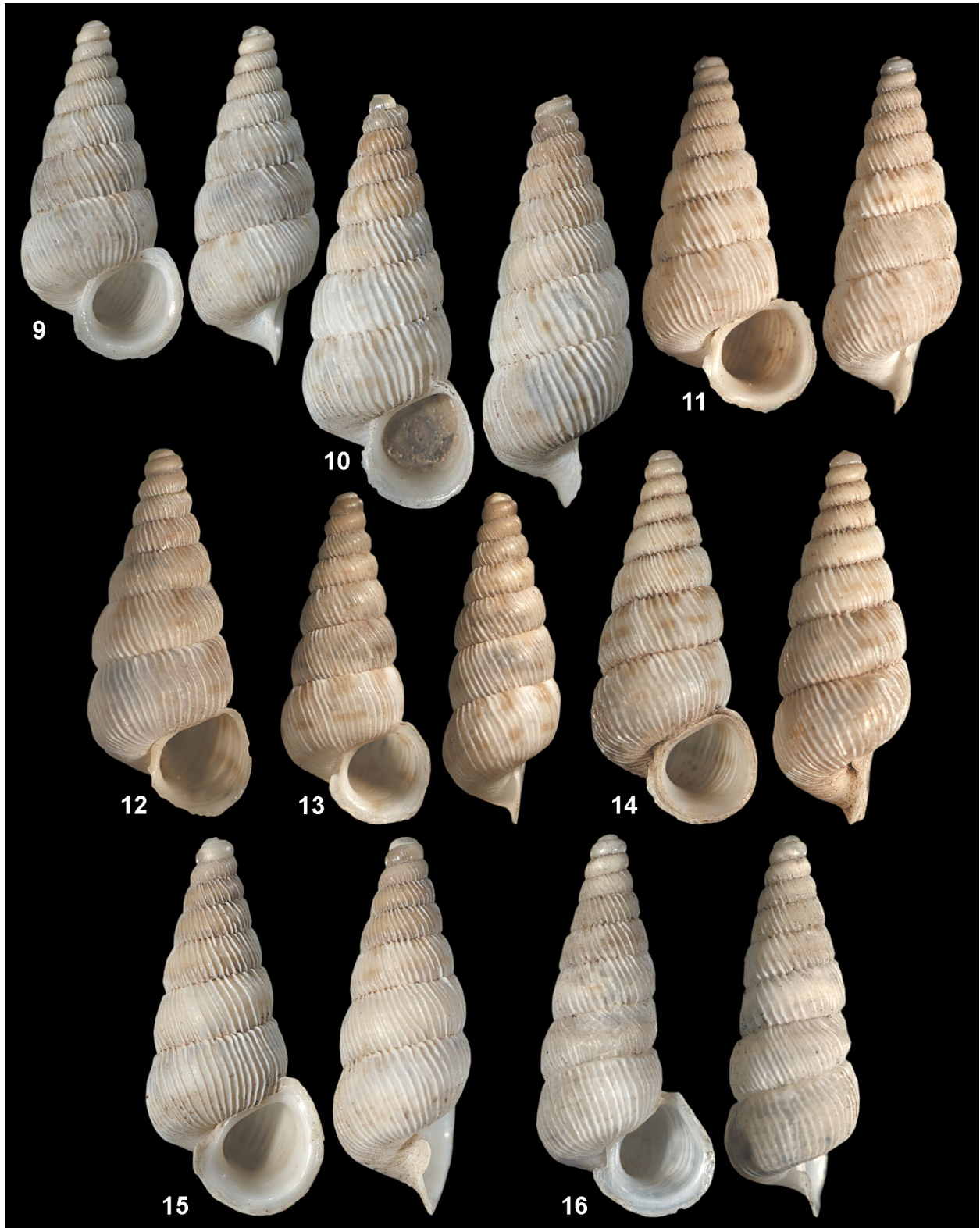
Figs 2-8. Cochlostomidae from Northern Africa. **2-3.** *Obscurella marocanum* (Pallary, 1928). **2.** *Pomatias marocanus*, syntype SMF 160913, Morocco, Tizi r’Nim, H 13.05 mm. **3.** NMBE 550133, 26 km SW Beni Mellal, H 12.2 mm. **4-6.** *Cochlostoma atlanticum* (BOURGUIGNAT, 1868). **4.** *Pomatias atlanticus*, syntype MHNG-MOLL 104068, Algeria, Gorge de l’Oued-Isser, H 8.2 mm. **5.** *Pomatias maresi*, syntype MHNG-MOLL 104103, Algeria, Ait Zikki, H 6.9 mm. **6.** *Pomatias pechaudi*, MHNG-MOLL 104113, Algeria, Djebel Bou Zegza, entre la Mitidja (Sahel Mitidja) et la Kabylie, H 7.8 mm. **7.** *Cochlostoma susaense* BRANDT, 1958. Holotype SMF 155506, Libya, Wadi Haulla at the Susa pass, H 6.4 mm. **8.** *Cochlostoma barcaense* Brandt, 1958. Holotype SMF 155508, Libya, Wadi es Sahaba east of Apollonia, H 7.2 mm. Photos Neubert $\times 6$.

titude, entre Beni Mellal et Ouauizert, moyen Atlas méridional”.

Type specimens (Fig. 2). — Syntypes SMF 160913/4, coll. K.L. Pfeiffer ex Pallary (see also Zilch, 1958: 69, pl. 5 fig. 27).

Non-type specimens (Fig. 3). — **Morocco:** 26 km SW of Beni Mellal, 18 km NNE of Azilal, 970 m alt., 29.xi.1988, NMBE 550133/2, MENK/8; 10 km ESE Timoulilt, 15 km S Beni Mellal, 1330 m alt., 29.xii.1988, NMBE 550134/1, MENK/2.

Description. — Shell conic, consisting of 9 convex and



Figs 9-16. *Cochlostoma letourneuxi* (Bourguignat, 1866), various syntypes. **9.** *Pomatias letourneuxi*, lectotype MHNG-MOLL 104090, Algeria, Roknia, H 9.6 mm. **10.** *Pomatias henoni*, syntype MHNG-MOLL 104083, Algeria, El-Arrouch, H 11.7 mm. **11.** *Pomatias cyclonixius*, syntype MHNG-MOLL 104072, Algeria, Dolmens de Roknia, H 10.1 mm. **12.** *Pomatias belloiri*, syntype MHNG-MOLL 104070, Algeria, Djebel Thaya, H 10.4 mm. **13.** *Pomatias euneus*, syntype MHNG-MOLL 104075, Algeria, Djebel Guetar (Djebel Gustar), H 9.4 mm. **14.** *Pomatias monticola*, syntype MHNG-MOLL 104109, Algeria, Djebel Guetar (= Djebel Gustar), H 10.6 mm. **15.** *Pomatias euristoma*, syntype MHNG-MOLL 104081, Tunisia, Kef-el-Hanech, H 10.7 mm. **16.** *Pomatias rogeri*, syntype MHNG-MOLL 104118, Tunisia, Kef-el-Hanech, H 10.7 mm. Photos Neubert $\times 6$.

weakly carinated whorls; protoconch brownish in colour consisting of 2 smooth whorls; teleoconch grey whitish in colour; deep suture; surface of the teleoconch conspicuously and widely ribbed; ribs eminently thickened subsuturally; last whorl perfectly keeled; aperture sub-circular to sub-oviform; peristome discontinuous with widened and flattened edge.

Measurements. — Syntype *marocanus*: H = 11.15 mm; D = 4.55 mm.

Distribution (Fig. 1). — So far, this species is only recorded from a small range within the province Tadla-Azilal, central Morocco.

Remarks. — The classification of this species in *Obscurella* follows Zallot et al. (2015; 2024: 126).

Cochlostoma atlanticum (Bourguignat, 1868)

Figs 1, 4-6

Pomatias atlanticus Bourguignat, 1868, Moll. nouv. litig., 1 (9): 290-292, pl. 40 figs 13-16 (shell). Type locality: “dans les gorges de l’Oued-Isser, en Kabylie”. Remark: also published 1868 by Bourguignat in Rev. Mag. Zool., (2) 20 (11): 430-432, pl. 15 figs 13-16.

Pomatias maresi Bourguignat, 1868, Moll. nouv. litig., 1 (9): 291-292. Type locality: “En Kabylie, sur les rochers à Tizi n’cheria, et à Thabourth-Bousgueur, dans le Djurdjura”. Remark (1): also published 1868 by Bourguignat in Rev. Mag. Zool., (2) 20 (11): 431. Remark (2): also described as *Pomatias maresi* by Letourneux (1870, Ann. Malac., 1 (3): 313-314) with additional localities (“Le long des grandes masses calcaires des Azerou, à Tizi-n-Cheriâ, chez les Aït-Zikki, les Aït-Ouaban et à Tabourth-Bousgueur”); but the name was nomenclaturally already made available by Bourguignat in 1868 because of his comparison of *atlanticus* with *maresi*.

Pomatias (Auritus) atlanticus var. *pechaudi* A.J. Wagner, 1897, Denkschr. kais. Akad. Wiss., math.-naturw. Cl., 64: 603, pl. 6 fig. 63 (shell). Type locality: “Benibou-Addou, Chaîne du Djurdjura, Kabylie, 1200 m sup. mare”. Remark: *Pomatias pechaudi* Bourguignat, 1887, in Letourneux & Bourguignat, Prodrome malac. terr. fluv. Tunisie: 135 is a nomen nudum.

Type specimens (Figs 4-5). — *atlanticus*: syntypes MHNG-MOLL 104068/4, Algeria, Gorges de l’Oued-Isser. *maresi*: syntypes MHNG-MOLL 104106, Thabourth-Bousgueur, dans les monts du Djurdjura, en Kabylie; syntypes MHNG-MOLL 104094/14, Tizi N-Cheria en Kabylie. *pechaudi*: no specimens from the type locality in Bourguignat’s collection.

Non-type specimens (Fig. 6). — **Algeria**: MHNG-MOLL 104101, Algeria, Açouel, dans les Monts Djurdjura (sub *maresi*); MHNG-MOLL 104102, Aït-Ouabane, dans les Massif

du Djurdjura (sub *maresi*); MHNG-MOLL 104103/3, Aït Zikki (= Azrou-N-Aït Zikki), dans le massif du Djurdjura (sub *maresi*); MHNG-MOLL 104104, Chabet-El-Akra, en Petite Kabylie (sub *maresi*); MHNG-MOLL 104105, Kouriet, dans les Haut-Djurdjura (sub *maresi*); MHNG-MOLL 104107, Teith en Tazath en Kabylie (sub *maresi*); MHNG-MOLL 104108, Tizi-Boulma, dans les monts du Djurdjura (sub *maresi*); MHNG-MOLL 104113, Djebel Bou-Zegza, entre la Mitidja (= Sahel Mitidja) et la Kabylie (sub *pechaudi*); MHNG-MOLL 104114, Thabourth-Bousgueur, dans les monts du Djurdjura, en Kabylie (sub *pechaudi*); MHNG-MOLL 104115, Tizi-Boulma, dans les monts du Djurdjura (sub *pechaudi*); SMF 160470/2, Gorge d’Isser, coll. Kobelt; SMF 171759/2, Kabylie; SMF 160471/5, ditto.

Diagnosis. — Shell conic and slender, densely ribbed, very deep suture; convex whorls; peristome simple.

Description. — Shell small conic and slender, consisting of 9 convex whorls; colours not traceable from the type lot; protoconch consisting of 2 smooth whorls; teleoconch greyish in colour; suture very deep; external surface densely ribbed; last whorl perfectly rounded; aperture sub-circular; peristome simple, sometimes dilated and slightly reflected from columellar margin.

Measurements. — Syntype *atlanticus*: H = 8.25; D = 3.

Distribution (Fig. 1). — This species is only known from the Kabylie in eastern Algeria.

Remarks. — The type lot of *P. atlanticus* consists of a single adult and three subadult specimens with an almost not developed aperture. The type locality of *P. pechaudi*, Benibou-Addou, rather describes a territory of a tribe called “Beni Bou Addou” from the province of Algier than a precise locality.

Cochlostoma atlanticum is the type species (by monotypy) of *Atlantica* A. J. Wagner, 1897. The name is preoccupied by *Atlantica* Ancey, 1887. The species has recently been attributed to the subgenus *Turritus* Westerlund, 1883 by Zallot et al. (2024: 125-127, fig. 110), who presented an excellent figure a topotype; they wrongly mentioned 1863 as the publication date of *Pomatias atlanticus*.

Cochlostoma letourneuxi (Bourguignat, 1866)

Figs 1, 9-24

Pomatias letourneuxi Bourguignat, 1866, Moll. nouv. litig., 1 (7): 216-217, pl. 33 fig. 22-23 (shell). Type locality: “à Roknia, dans la tribu des Meziet-Caidat des Zardeza, non loin d’Hammam-Meskoutin (province de Constantine)”. *Pomatias perseianum* Kobelt, 1886, Nachrichtsbl. dtsh. malakozool. Ges., 18 (3/4): 48. Type locality: “Dschebel bu-Kornein”. Remark: figured in Kobelt, 1892, Icon. (2) 5 (5/6): 89, pl. 142 fig. 904.

Pomatias perseianum var. *ziguense* Kobelt, 1886, Nach-

- richtsbl. dtsch. malakozool. Ges., 18 (7/8): 109. Type locality: “Dschebel Zaghuan”. Remark: figured in Kobelt, 1892, Icon. (2) 5 (5/6): 90, pl. 142 fig. 905.
- Pomatias funereus* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 135. Nomen nudum.
- Pomatias rokniacus* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 135. Nomen nudum.
- Pomatias thayacus* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 135. Nomen nudum.
- Pomatias belloiri* Letourneux, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 135. Type locality: “Cette espèce, découverte sur les rochers des Djebel Thaya et Guerar, dans la province de Constantine, a été retrouvée en Tunisie, non loin de la source du Djebel Zaghuan”.
- Pomatias latasteanus* Letourneux & Bourguignat, 1887, Prodr. malac. terr. fluv. Tunisie: 135-136. Type locality: “Sur les rochers, au Djebel Reças”.
- Pomatias tunetanus* Letourneux & Bourguignat, 1887, Prodr. malac. terr. fluv. Tunisie: 136. Type locality: “répandu sur les montagnes, au-dessus d’Hammam-el-Lif, au Zaghoun, sur les collines près de l’Oued El-Hammam, ainsi que dans le domaine de l’Enfida, à Takrouna et à Hammam-Zeriba”.
- Pomatias henoni* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 136-137. Type locality: “d’abord découvert à El-Harrouch, entre Philippeville et Constantine, puis à Roknia, près Hammam-Meskhoutin, a été retrouvé en Tunisie, dans les anfractuosités des rochers, au Djebel Bou-Kourneïn (Doûm.-Ad.), ainsi qu’au Djebel Reças, aux environs d’Hammam-el-Lif, et aux alentours de Mokta-el-Hadjar”.
- Pomatias cyclonixius* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 137-138. Type locality: “Cette belle espèce, dont le type provient de Roknia, dans la province de Constantine, a été recueillie dans le Djebel Zaghuan”.
- Pomatias euristoma* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 137. Type locality: “découverte à Roknia, puis à Hammam-Meskhoutin, a été retrouvée en Tunisie, au Kef Al-Hannech, chez les Oulad-Ali”. Remark: Kobelt (1902, Das Tierreich, 16: 509) emended the name into *eurystoma*.
- Pomatias euneus* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 138. Type locality: “Le type de cette petite espèce vit sur les rochers des Djebel Guerar et Thaya, dans la province de Constantine. En Tunisie, ce *Pomatias* a été constaté au Djebel Reças et sur les collines au dessus d’Hammam-el-Lif”.
- Pomatias rogeri* Letourneux & Bourguignat, 1887, Prodr. malac. terr. fluv. Tunisie: 138. Type locality: “vit au Kef El-Hannech, chez les Oulad-Ali”.
- Pomatias monticola* Bourguignat, 1887, in: Letourneux & Bourguignat, Prodr. malac. terr. fluv. Tunisie: 139. Type locality: “Le type de ce *Pomatias* se trouve sur le Djebel Guerar, haute montagne près d’Hammam-Meskhoutin, dans la province de Constantine. En Tunisie, cette même espèce a été constatée sur les sommets des Djebel Reças et Bou-Kourneïn”.
- Pomatias doumeti* Letourneux & Bourguignat, 1887, Prodr. malac. terr. fluv. Tunisie: 139. Type locality: “Anfractuosités des rochers, au Djebel Bou-Kourneïn”.
- Pomatias punicus* Letourneux & Bourguignat, 1887, Prodr. malac. terr. fluv. Tunisie: 139-140. Type locality: “au Djebel Reças”.
- Pomatias euconus* Ancey, 1888, Le Naturaliste, (2) 2 [= 10^e année] (37): 215-216, fig. 2 (shell) [reprint: 15-16, fig. 2]. Type locality: “Djebel Ichkeul, non loin de Bizerte, en Tunisie”.
- Pomatias euconus* var. *platygyrus* Ancey, 1888, Le Naturaliste, (2) 2 [= 10^e année] (37): 216 [reprint: 16]. Type locality: “Djebel Ichkeul, non loin de Bizerte, en Tunisie”.

Type specimens (Figs 9-16, 18-24). — **letourneuxi**: The type lot MHNG-MOLL 104090 contains 5 specimens: Algeria, Roknia, près de Hammam Meskoutine; lectotype here designated, 4 remaining paralectotypes. **henoni**: 1 syntype MHNG-MOLL 104083, Algeria, El-Arrouch, entre Philippeville (= Skikda) et Constantine. **perseianum**: lectotype (selected by Zilch, 1958: 61, pl. 4 fig. 10) SMF 160206, Tunisia, Djebel Boukornine, coll. Kobelt (= Orig. Icon.: fig. 904). Paralectotypes: SMF 160208/1, Ben Arous (Bin ‘Arus), Djebel Bu Kornein [Djebel Boukornine], coll. Kobelt; SMF 160209/96, Ben Arous (Bin ‘Arus), Djebel Bu Kornein [Djebel Boukornine], coll. Kobelt; SMF 160212/15, Ben Arous (Bin ‘Arus), Djebel Bu Kornein [Djebel Boukornine], coll. K.L. Pfeiffer ex C.R. Boettger 1907; SMF 160207/5, Ben Arous (Bin ‘Arus), Djebel Bu Kornein [Djebel Boukornine], coll. Kobelt; SMF 160210/3, Ben Arous (Bin, Arus), Djebel Bu Kornein [Djebel Boukornine], coll. K.L. Pfeiffer ex Jetschin ex A.J. Wagner 1898; SMF 160211/7, Ben Arous (Bin, Arus), Djebel Bu Kornein [Djebel Boukornine], coll. Moellendorff ex Kobelt. **perseianum** var. **ziguense**: lectotype (selected by Zilch, 1958: 62, pl. 4 fig. 11) SMF 160222, Tunisia, Djebel Zaghuan (= Orig. Icon.: fig. 905). Paralectotypes: SMF 160223/5, Djebel Zaghuan [Djebel Zaghuan], coll. Kobelt; SMF 160224/74, ditto; SMF 160225/, ditto coll. O. Boettger ex Kobelt 1888; SMF 160226/5, ditto coll. Moellendorff ex Kobelt; SMF 160227/6, ditto coll. Naegel ex Kobelt; SMF 160221/2, ditto, coll. K.L. Pfeiffer ex Jetschin ex Kobelt. **belloiri**: syntypes MHNG-MOLL 104069/2, Algeria, Djebel Guetar, près du Thaya; MHNG-MOLL 104070/4, Algeria, Djebel Thaya (= Dje-

bel Taya), près de Roknia; MHNG-MOLL 104071/3, Tunisia, près de la source de Djebel Zaghwan (= Jabal Zaghwan). **latasteanus**: 1 syntype MHNG-MOLL 104089, Tunisia, Djebel Reças (= Jabal Ar Rasas), près de Tunis. „**rokniacus**“ (nomen nudum): „syntypes“ MHNG-MOLL 104119, MHNG-MOLL 104121, Dolmens de Roknia. „**funereus**“ (nomen nudum): „syntype“ MHNG-MOLL 104082, Dolmens de Roknia. „**thayacus**“ (nomen nudum): „syntype“ MHNG-MOLL 104120, Djebel-Thaya (= Djebel Taya), près de Roknia. **cycloni-xius**: syntypes MHNG-MOLL 104072/2, Algeria, Dolmens de Roknia; MHNG-MOLL 104073/1, Tunisia, Djebel-Zaghwan (= Jabal Zaghwan). **tunetanus** (all syntypes from Tunisia): MHNG-MOLL 104122/8, Djebel Zaghwan (= Jabal Zaghwan); MHNG-MOLL 104123/2, Hammam Lif (= Hammam Al Anf); MHNG-MOLL 104124/1, Hammam Zeriba (= Zriba= Zaribah), au nord d’Enfidaville; MHNG-MOLL 104125/5, Oued-el-Hamma; MHNG-MOLL 104126/2, Colline, près de Takrouna (= Taktuna= Takrounah), près d’Enfidaville; MHNG-MOLL 104127/5, Djebel Zaghwan (= Jabal Zaghwan); SMF 160220/1, Djebel Zaghwan (= Jabal Zaghwan), coll. K.L. Pfeiffer ex Jetschin ex Letourneux. **euristoma**: syntypes MHNG-MOLL 104080/8, Algeria, Dolmens de Roknia; MHNG-MOLL 104081/5, Tunisia, Kef-el-Hanech (= Bi’r Al Hanesh = Bir Al Hanash), près de’Oulad Ali (Oulad Ali Bir = Awlad Ali Bir). **euneus**: syntypes MHNG-MOLL 104075/3, Algeria, Djebel Guetar (= Djebel Gustar), près de Thaya (= Taya); MHNG-MOLL 104076/5, Djebel Thaya (= Djebel Taya), près de Roknia; MHNG-MOLL 104077/1, Algeria, Dolmens de Roknia; MHNG-MOLL 104078/6, Djebel Reças (= Jabal Ar Rasas), près de Tunis; MHNG-MOLL 104079/16, Tunisia, Hammam Lif (= Hammam Al Anf), près de Tunis. **rogeri**: syntypes MHNG-MOLL 104118/2, Tunisia, Kef-el-Hanech (= Bi’r Al Hanesh= Bir Al Hanash), près de’Oulad Ali (Oulad Ali Bir = Awlad Ali Bir). **monticola**: holotype MHNG-MOLL 104109: Algeria, Djebel Guetar (= Djebel Gustar), près du Thaya (= Djebel Taya) [there is a single specimen from Djebel Guerar, which was called “type” by Bourguignat, and thus can be considered as holotype]; paratypes MHNG-MOLL 104110/2, Tunisia, Djebel Boukornine (= Jabal Bu Qarnayn), près de Hammam Lif; MHNG-MOLL 104111/1, Djebel Reças (= Jabal Ar Rasas), près de Tunis. **doumeti**: 1 syntype MHNG-MOLL 104074, Tunisia, Djebel Boukornine (= Jabal Bu Qarnayn), près de Hammam Lif. **punicus**: 1 syntype MHNG-MOLL 104117, Tunisia, Djebel Reças (= Jabal Ar Rasas), près de Tunis. **euconus**: syntypes SMF 160231/2, Bizerte (Banzart), Djebel Ischkeul (Djebel Ichkeul), coll. Moellendorff ex Ancey.

Non-type specimens. — **Tunisia**: Prov. Bizerte: Ichkeul, 04.iii.2007, coll. Abbes/24; SMF 160232/5, Djebel Ischkeul (Djebel Ichkeul), coll. Kobelt ex P. Pallary; Djebel Zelba, 23.xii.2008, coll. Abbes/8; Aïn Touta, 23.xii.2008, coll. Abbes/452; Kef Chegug, coll. Ezzine in NMBE. — Prov. Beja: Nefza, 24.xii.2008, coll. Abbes/48; Djebba,

06.ii.2005, coll. Abbes/21. — Prov. Ben Arous: MHNG-MOLL 104085, Djebel-Bou-Kournine (= Jabal Bu Qarnayn), près de Hammam Lif (sub *henoni*); MHNG-MOLL 104095, Djebel-Bou-Kournine (= Jabal Bu Qarnayn), près de Hammam Lif (sub *letourneuxi*); Djebel Reças, 09.x.2008, coll. Abbes/32; MHNG-MOLL 104086/13, Djebel Reças (= Jabal Ar Rasas), près de Tunis (sub *henoni*); MHNG-MOLL 104087/5, Hammam Lif (= Hammam Al Anf), près de Tunis; MHNG-MOLL 104096/12, Djebel Reças (= Jabal Ar Rasas), près de Tunis (sub *letourneuxi*); SMF 160213/44, Hammam Lif, coll. Kobelt; SMF 202270/1, Hammam Lif, coll. S. Jaeckel; SMF 160214/5, Hammam Lif, coll. K.L. Pfeiffer ex C.R. Boettger 1905; SMF 160215/2, Hammam Lif, coll. O. Boettger ex Kathariner 1899; SMF 171664/4, Djebel Bu Kornein [Djebel Boukornine], coll. C. Bosch ex H. Rolle; SMF 160218/2, Djebel Bu Kornein [Djebel Boukornine], coll. Schlüter ex P. Ehrmann; Boukornine, coll. Ezzine in NMBE; SMF 160228/1, Djebel Bu Kornein [Djebel Boukornine], coll. O. Boettger ex K. Escherich 1894; SMF 160229/16, Djebel Ressay [Djebel Reças], coll. O. Boettger ex Kobelt 1888; SMF 160230/12, Djebel Ressay [Djebel Reças], coll. O. Boettger ex Kobelt 1888; SMF 160217/10, Djebel Ressay [Djebel Recas], coll. K.L. Pfeiffer ex C.R. Boettger 1905; SMF 160216/4, Djebel Ressay [Djebel Recas], coll. K.L. Pfeiffer ex Jetschin ex Kobelt. — Prov. Zaghwan: Djebel Zriba (Zriba Hammam), 20.viii.2008, coll. Abbes/60; MHNG-MOLL 104098/2, Hammam Zeriba (= Zriba = Zaribah), au nord d’Enfidaville (sub *letourneuxi*); Djebel Zaghwan 05.x.2008, coll. Abbes/557; MHNG-MOLL 104088/11, Mokta-El-Hadjar (= Oued-El-Hadjar, Zaghwan) (sub *henoni*); MHNG-MOLL 104097/10, près de la source de Djebel Zaghwan (= Jabal Zaghwan) (sub *letourneuxi*); MHNG-MOLL 104100/8, Mokta-El-Hadjar (= Oued-El-Hadjar) (sub *letourneuxi*); MHNG-MOLL 104099/6, Kef-el-Hanech (= Bi’r Al Hanesh= Bir Al Hanash), près de’Oulad Ali (Oulad Ali Bir = Awlad Ali Bir?) (sub *letourneuxi*); SMF 160219/3, Djebel Zaghwan [Djebel Zaghwan], ± 1000 m, coll. K.L. Pfeiffer ex Jetschin ex Coutagne 1903; SMF 161085/8, Zaghwan (Zaghwan), Oberlauf Wadi Rebia b. Zaghwan, coll. Zilch ex Brandt, 27.iii.1958. — Prov. Siliana: Djebel Serj, 28.xii.2008, coll. Abbes/27 + coll. Ezzine in NMBE; Kesra, 27.xii.2008, coll. Abbes/4.

Algeria: MHNG-MOLL 104091/51, Dolmens de Roknia; MHNG-MOLL 104092/80, Dolmens de Roknia (sub *letourneuxi*); MHNG-MOLL 104093/19, Djebel Guetar (= Djebel Gustar), près du Thaya (= Djebel Taya) (sub *letourneuxi*); MHNG-MOLL 104084/21, Dolmens de Roknia (sub *henoni*); SMF 160194/2, Roknia, coll. Kobelt ex Vimont (= Orig. Icon.: fig. 902); SMF 160195/2, Roknia, coll. Kobelt; SMF 160200/4, Roknia, coll. Kobelt; SMF 160197/79, Guelma, coll. Kobelt; SMF 160196/5, Guelma, coll. Kobelt; SMF 160198/5, Guelma, coll. Moellendorff ex Kobelt; SMF 160199/2, Guelma, coll. K. L. Pfeiffer ex Jetschin ex Kobelt 1888; SMF 160201/4, Djebel Taya, coll. Kobelt ex Pallary; SMF 102222/2, Col des Oliv-

iers, coll. S.H. Jaeckel; SMF 160202/9, ditto, coll. Kobelt; SMF 160204/2, ditto, coll. K.L. Pfeiffer ex Jetschin ex Kobelt 1888; SMF 160205/25, ditto, coll. K.L. Pfeiffer ex C.R. Boettger 1907; SMF 160203/84, ditto, coll. Kobelt.

Diagnosis. — Shell grey to yellowish, sometimes with red-brown spots; suture moderately deep; ribs sometimes slightly thickened subsuturally; suture moderately deep; peristome simple to doubled; columellar peristome expansion may be large or lacking; shell ribbed, ribs thickened in the suture ending, suture deep; peristome discontinuous with flattened and wide edge.

Description. — Shell slender conical, consisting of 7 to 9 convex whorls; protoconch brownish to translucent, consisting of 2 smooth whorls; teleoconch grey to yellowish in colour, sometimes ornamented with red-brown spots arranged below the suture and below the periphery of each whorl; suture moderately deep; surface of the teleoconch conspicuously ribbed, rib density per whorl varies between 42 to 74, ribs sometimes slightly thickened subsuturally; last whorl generally rounded and sometimes inconspicuously keeled; aperture sub-circular to obliquely oval, sometimes with a faint sinulus; peristome discontinuous, simple or doubled; upper and lower (columellar) expansion of the peristome present or completely absent; if present, columellar expansion may be large, but is never connected to the last whorl; umbilicus closed to slit-like open.

Measurements. — Lectotype *letourneuxi*: H = 9.6 mm; D = 3.7 mm.

Additional measurements. — Mean data from 10 localities measured (n = 330): H = 9.93 ± 0.6 mm; D = 3.9 ± 0.16. — Ichkeul (n = 80): H = 9.14 ± 0.66 mm; D = 3.53 ± 0.18; Djebba (n = 16): H = 10.65 ± 0.87 mm; D = 4.03 ± 0.23; Nefza (n = 43): H = 9.25 ± 0.6 mm; D = 3.50 ± 0.16; Djebel Zelba (n = 9):

H = 9.78 ± 0.37 mm; D = 4.03 ± 0.23; Kesra (n = 3): H = 9.6 ± 0.6 mm; D = 3.34 ± 1.48; Djebel Serj (n = 27): H = 11.0 mm; D = 4.0 mm; Djebel Recas (n = 32): H = 9.5 ± 0.57 mm; D = 4.0; Zriba Hammem (n = 40): H = 9.5 ± 0.7 mm; D = 4.0; Djebel Zaghouan (n = 40): H = 10.33 ± 0.47 mm; D = 3.98 ± 0.23; Ain Touta (n = 40): H = 10.26 ± 0.8 mm; D = 4.02 ± 0.21.

Remarks. — *Pomatias tunetanus* is here selected as the type species of *Tunetana* A. J. Wagner, 1897, by virtual tautonymy, following ICZN Recommendation 69A.2.

Shell variation in gonochoristic groups may be caused by the sex of the particular animal (Reichenbach et al. 2012). So, the question was whether there are any differences in the shell features of females vs. males, which may explain the enormous number of described taxa. We used the data retrieved from three localities (Table 1) and investigated the following questions: What is the ratio between the sexes? Is there any difference between females and males concerning the shell size and the shell ribbing pattern?

Our results show some differences between the three populations studied. As can be seen in Table 1, the number of ribs is not significantly different between male and female animals. However, the rib density in general is much higher in Ichkeul than in the other two populations. In general, all males have a shell which is ca. 8 % longer than that of females (Fig. 17). Shell diameter is higher in females than in males. This differs markedly from the results of Reichenbach et al. (2012: 6, table 1) for the European species *C. septemspirale* (Razoumowsky, 1789), who found that in this species females have a more slender and longer shell than males.

Concerning the sex ratio, the results are difficult to interpret; probably, the random sample of these three locali-

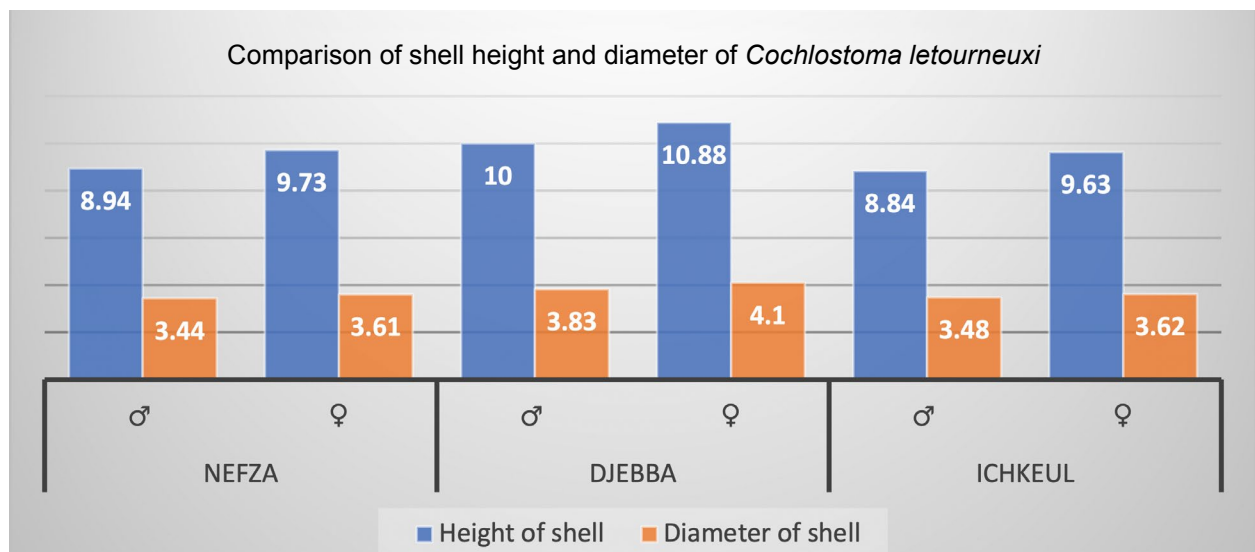


Fig. 17. Diagram of shell height and shell diameter of sexed specimens of *Cochlostoma letourneuxi* in three localities from Tunisia.



Figs 18-24. *Cochlostoma letourneuxi* (Bourguignat, 1866). **18.** *Pomatias latasteanus*, syntype MHNG-MOLL 104089, Tunisia, Djebel Reças, H 10.9 mm. **19.** *Pomatias punicus*, syntype MHNG-MOLL 104117, Tunisia, Djebel Reças, H 9.1 mm. **20.** *Pomatias euconus*, syntype SMF 160239, Djebel Ischkeul close Bizerta, H 10.1 mm. **21.** *Pomatias perseianum*, syntype SMF 160206, Tunisia, Djebel Bu Kournine, H 10.6 mm. **22.** *Pomatias doumeti*, syntype MHNG-MOLL 104074, Tunisia, Djebel-Bou-Kournine, H 11.4 mm. **23.** *Pomatias tunetanus*, syntype MHNG-MOLL 104122, Tunisia, Djebel Zaghouan, H 11.4 mm. **24.** *Pomatias perseianum* var. *ziguense*, syntype SMF 160222, Djebel Zaghouan, H 10.7 mm. Photos Neubert × 6.

Localities/characters	Nefza		Djebba		Ichkeul	
	♂ (n = 25)	♀ (n = 18)	♂ (n = 4)	♀ (n = 12)	♂ (n = 37)	♀ (n = 21)
Number of ribs	42	42	52	56	73	74
Height of shell	8.94	9.73	10.0	10.88	8.84	9.63
Diameter of shell	3.44	3.61	3.83	4.10	3.48	3.62
Sex ratio	>1		<1		>1	

Table 1. Differences of shell characters in male and female specimens of *C. letourneuxi* from three localities.

ties is too small. In Nefza and Ichkeul, the ratio between males and females is not really balanced, but there is no dramatic difference in numbers. In Djebba, the number of preserved specimens was probably too small to give a reasonable result. However, Reichenbach et al. (2012: 12, table 3) sexed five populations of *C. septemspirale* and found similarly unbalanced ratios. Overall, their average ratio is 0.95, i.e. on a larger scale, there is no major unbalance in the ratio between the sexes. We assume that the same applies for *C. letourneuxi*.

Concluding we can say that probably the creation of some of the new “species” of Bourguignat & Letourneux may have been triggered by such subtle differences in shell shape between sexes. Having collected almost 500 specimens of *Cochlostoma* on Djebel Zaghouan, almost all types of these “species” could be found back. These shell morphs are interconnected by intergrading specimens. This proves that their concept of many syntopic species cannot be followed.

Distribution (Fig. 1). — This species occurs in Tunisia and Algeria only. It prefers calcareous substrate and is found on open rock faces and cracks in the mountains.

Cochlostoma susaense Brandt, 1958

Figs 1, 7

Cochlostoma (Apolloniana) susaense Brandt, 1958, Arch. Moll., 87 (1/3): 3, pl. 1 fig. 2 (shell). Type locality: “Wadi Haulla am Susa-Paß, rechter Abhang vor der Ridotta segnale”.

Type specimens (Fig. 7). — Holotype SMF 155506; paratypes: SMF 155507/5 (see also Zilch, 1958: 70, pl. 5 fig. 28 = holotype).

Non-type specimens. — **Libya:** SMF 161089/4, Wadi Heira, Susa, coll. Brandt, 08.iii.1958; SMF 161675/10, Wadi Heira, Susa, coll. Brandt, 10.iii.1959; SMF 161088/6, Wadi Mabuhl, W. Alba, coll. Brandt, 08.iii.1958; SMF 161090/5, Wadi Heira, Susa, coll. Brandt, 08.iii.1958; SMF 168849/4, Wadi Mahboul, coll. Schlickum (9546) ex Brandt, 13.iv.1959; SMF 161678/11, Wadi Mahboul, Susa, coll. Brandt, 13.iv.1960; SMF 161447/6, Wadi en Nsuria, coll. Brandt, 30.xi.1958; SMF 161218/6, Wadi

Hesein, Susa, coll. Brandt, 08.iii.1958; without catalogue number/3, W of Apollonia, coll. Kaltenbach (10898) 1942; SMF 161676/6, Wadi Mahboul, coll. Brandt, 12.iv.1959; SMF 161680/5, Wadi Mahboul, Susa, coll. Brandt.

Diagnosis. — Shell shouldered and ribbed, suture very deep; flattened whorls; peristome continuous and with upper and lower ears.

Description. — Shell conic, consisting of 7 more or less flattened whorls; protoconch greyish consisting of 2 smooth whorls; teleoconch greyish; suture deep; surface of teleoconch conspicuously ribbed, ribs slightly thickened sub-suturally; whorls shouldered; aperture sub-circular; peristome continuous and with upper and lower ears, parietal side sometimes fused to the wall of last whorl.

Measurements. — Holotype *susaense*: H = 6.4; D = 2.6.

Distribution (Fig. 1). — Endemic to the Cyrenaica in eastern Libya.

Remarks. — The arrangement of the spots and the shape of the aperture is similar to *C. alleryanum* (Paulucci, 1879) from Sicily. In other aspects the shell of *C. susaense* is rather aberrant; for this species the monotypic subgenus *Apolloniana* has been erected by Brandt.

Cochlostoma barcaense Brandt, 1958

Figs 1, 8

Cochlostoma (Turritus) barcaense Brandt, 1958, Arch. Moll., 87 (1/3): 1-3, pl. 1 fig. 1 (shell). Type locality: “Wadi es Sahaba (ö. Apollonia), linker Abhang unterhalb der alten Brücke”.

Type material (Fig. 8). — Holotype SMF 155508; paratypes SMF 155509/5 (see also Zilch, 1958: 63, pl. 5 fig. 29 = holotype).

Non-type specimens. — **Libya:** Apollonia, coll. Brandt, 06.xi.1955; SMF 158092/9, Wadi en Nsuria, coll. Brandt, 13.xi.1955; SMF 161086/2, Djebel slope between Wadi Bu Msafer and Wadi en Naga close to Desra, coll. Brandt, 09.iii.1958; SMF 161087/6, Wadi Haleigh, coll. Brandt, 05.iii.1959; SMF 161676/12, Wadi Felu, coll. Brandt, 30.xi.1958; SMF 161677/10, Wadi Asra near Farzugha, coll. Brandt, 04.x.1955; SMF 158091/5, Wadi Caab Maddalena, coll.

Brandt, 26.ii.1956; SMF 158090/6, Wadi Giadia, coll. Brandt, 13.x.1955; SMF 158093/6, Wadi?, coll. Brandt, 23.x.1955; SMF 158087/6, Wadi Susa, coll. Brandt, 31.vii.1955; SMF 158136/2, Wadi Chresei, coll. Brandt, 04.v.1957; SMF 158618/5, Wadi Zaza (vorm Plateau), coll. Brandt, 04.v.1957; SMF without/1, Wadi Cat, coll. Kaltenbach (10900) 1942; SMF without/1, Derna between first and second serpentine to Tobruk, coll. Kaltenbach (10901) 1942; SMF without/1, ca. 8 km W. Derna, coll. Kaltenbach (10899) 1941.

Diagnosis. — Shell conspicuously ribbed, very deep suture; peristome simple.

Description. — Shell conic consisting of 8 convex whorls; protoconch brownish consisting of two 2 smooth whorls; teleoconch grey with red-brown spots placed randomly; suture very deep; surface of teleoconch conspicuously and regularly spaced ribs; last whorl perfectly rounded; aperture sub-circular; peristome simple with very slight columellar expansion.

Measurements. — Holotype *barcaense*: H = 7.2 mm; D = 3.2 mm; paratypes SMF 155509 (n = 5): H = 6.05 ± 0.8 mm; D = 2.7 ± 0.3 mm.

Distribution (Fig. 1). — Only known from the Cyrenaica in eastern Libya.

Remarks. — This species is similar to *C. atlanticum* (from Algeria) in the shape of the shell and the convex form of the whorls; the main differential feature is the particular ornamentation of the shell of *C. barcaense*, characterized by more or less wide spots placed randomly on the external surface of the shell. More field investigations are needed to know if this is a permanent differential feature.

DISCUSSION

The relationships of the *Cochlostoma* species in the southern part of the distribution range still are not clear, because revisions of these groups are lacking until today. Despite its isolated position in central Morocco, *O. marocana* is clearly related to the Iberian *Obscurella*-group. Towards east, there is a gap of almost 1,000 km without any record of a species of Cochlostomatidae. The next group consists of *C. atlanticum* and *C. letourneuxi*, who inhabit the Greater Kabylie and the northern area of Tunisia. Finally, there is another highly isolated occurrence of Cochlostomatidae restricted to the humid mountains in the Cyrenaika in Libya, and demarcates the distribution boundary of the family, which does not occur in the Levant area.

From a conchological point of view, the species living on Sicily are quite close to *C. atlanticum* and *C. letourneuxi*. Zallot et al. (2015) revised some subgenera of *Cochlostoma* but could not allocate with certainty any of the North African species to their system. They list *P. perseianum* (= *letourneuxi*, this study) in the subgenus *Auritus*

Westerlund, 1883, and do so for *perseianum*, *euconus* and *letourneuxi* in 2024 (: 126-127) but do not supply anatomical or genetic data supporting this statement. Zallot et al. (2024: 125-127) assigned with *C. atlanticum* provisionally to the subgenus *Turritus*. However, for *C. atlanticum* and *C. letourneuxi*, no anatomical or genetic data have been available, nor for the two Libyan species. Some of the North African species strongly resemble Sicilian congeners like *C. turriculatum* (Philippi, 1836) or *C. alleryanum* (Paulucci, 1879) (Cossignani & Cossignani, 2020), both listed by Zallot et al. (2015) in *Auritus*. The systematic position of the subgenus *Apolloniana* Brandt, 1958, erected for the aberrant species *susaense*, is also unclear; interestingly *barcaense* has been assigned to *Apolloniana* as well (Zallot et al., 2024: 127), whereas Brandt (1958: 1) originally placed *barcaense* into *Turritus*. As this insecure situation persists, we ignore the subgeneric classification.

Our shell-based approach revealed that there are no shell morphological features supporting the separation of the many taxa recorded in Tunisia and eastern Algeria from *C. letourneuxi*. Several of them occur in sympatry (if not syntopy) with many transitional specimens and several shared morphological characters (shape, size, and colour of the shell, apertural traits). For this reason, we unite all these “forms” under a single species, *C. letourneuxi*, awaiting a detailed molecular study to integrate them in the current structure of the group.

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Gazetteer

This gazetteer contains locality names often encountered in the relevant literature, particularly in Bourguignat.

Morocco	Province	Lat	Long
10 km ESE Timoulilt, 15 km S Beni Mellal	Beni Mellal	32.1976	-6.4062
26 km SW of Beni Mellal, 18 km NNE of Azilal	Beni Mellal	32.0938	-6.4802
Tizi r'Nim	Beni Mellal	32.1920	-6.3973
Algeria			
Açouel, dans les Monts Djurjura	Tizi-ouzou	36.4968	4.2073
Aït Zikki dans le massif du Djurjura	Tizi-ouzou	36.3354	4.3025
Beni-bou-Addou (= Aït Bouaddou; Aït Djemaa)	Tizi-ouzou	36.5083	4.0583
Chabet-El-Akra, en Petite Kabylie, NE Djebel Heizer	Bejaja	36.5299	5.2849
Col des Oliviers	Miliana	36.3483	2.3564
Djebel Bou-Zegza	El Kharrouba	36.6088	3.4542
Djebel Guetar (= Djebel Legrar près du Taya)	Guelma	36.5249	7.1084
Djebel Thaya = Taya	Skikda	36.5014	7.1234
Dolmens de Roknia	Guelma	36.5055	7.2639
El-Arrouch (= El Harrouch)	Skikda	36.6548	6.8365
Gorges de l'Oued-Isser [= Gorge de Palaestro]	Boumerdes	36.6007	3.5782
Hammam Meskhoutine	Guelma	36.4610	7.2686
Guelma	Guelma	36.5562	7.3308
Kouriet, dans les Haut-Djurjura	Tizi-ouzou	36.4991	4.1352
Roknia, près de Hammam Meskoutine	Guelma	36.5141	7.2141
Teith en Tazath en Kabylie	Tizi-ouzou	36.4985	4.2645
Thabourth-Bousgueur (= Tawwurt n l'insér?)	Tizi-ouzou	36.4903	4.0134
Tizi-Boulma (a mountain (1686 m alt.)), dans les monts du Djurdjura	Tizi-ouzou	?	?
Tizi n'cheria en Kabylie	Tizi-ouzou	36.5832	4.5335
Tunisia			
Aïn Touta	Bizerte	36.8840	9.5351
Ben Arous	Ben Arous	36.7443	10.2148
Djebel Serj [= Sarej]	Siliana	35.9038	9.4866
Djebba	Beja	36.4692	9.0985
Djebel Bu Korneïn (Jabal Bu Qarnayn)	Ben Arous	36.7120	10.3447
Djebel Ichkeul	Bizerte	37.1264	9.6701
Djebel Reças (= Jabal Ar Rasas)	Ben Arous	36.6068	10.3372
Djebel Zaghouan	Zaghouan	36.3714	10.1118
Djebel Zelba	Bizerte	36.9044	9.1697
Djebel Zriba (Zriba Hammem)	Zaghouan	36.3384	10.2049
Hammam Lif	Ben Arous	36.7277	10.3276
Hammam Zeriba (=Zriba=Zaribah), au nord d'Enfidaville	Zaghouan	36.3384	10.2049
Kef Chegueg	Bizerte	36.9014	9.52842
Kef-el-Hanech (= Bi'r Al Hanesh = Bir Al Hanash), près de'Oulad Ali (Oulad Ali Bir = Awlad Ali Bir)	Beja	36.8404	9.3322
Kesra	Siliana	35.8143	9.3609
Mokta-El-Hadjar (= Oued-El-Hadjar, Zaghouan)	Zaghouam	36.4135	10.1557
Nefza	Beja	36.9701	9.0843
Près de Takrouna (= Takruna= Takrounah), près d'Enfidaville	Sousse	36.1514	10.3368
Lybia			
Apollonia	Jabel Al Akhdar (Soussa)	32.9021	21.9725
ca. 8 km W Derna	Derna	32.7771	22.5393

Derna between first and second serpentine to Tobruk	Derna	32.7264	22.6701
Djebel slope between Wadi Bu Msafer and Wadi en Naga close to Derna	Derna	32.7419	22.5893
W of Apollonia	Jabel Al Akhdar (Al-Bidha)	32.8876	21.9584
Wadi Asra near Farzugha (= Farzougha)	Al Marj	32.5014	20.7280
Wadi Bu Msafer W Derna	Derna	32.7579	22.5594
Wadi Caab near El Aweilia	Al Marj	32.5248	21.0485
Wadi Cat	Al Bayda	32.6013	21.6715
Wadi Chresei NE Driana (= Daryanah)	Benghazi	32.4496	20.5818
Wadi en Nsuria W Apollonia	Al-Kobba	32.8863	21.8883
Wadi es Sahaba east of Apollonia, left slope below the old bridge	Jabel Al Akhdar (Al-Bidha)	32.8997	21.9877
Wadi Felu	?	?	?
Wadi Giadia near Apollonia	Jabel Al Akhdar (Soussa)	32.8863	21.8883
Wadi Haleigh el Asel close Tokra (= Taucheira)	Al Marj (Tokra)	32.4751	20.6027
Wadi Hesein	Derna	32.8919	22.0447
Wadi Haulla at the Susa pass, right slope before Ridotta segnale	Jabel Al Akhdar (Al-Abraq)	32.8208	21.9858
Wadi Heira, Susa, E Apollonia	Jabel Al Al Akhdar (Al-Bidha)	32.8989	21.9882
Wadi Mahboul, W Alba	Jabel Al Al Akhdar (Al-Bidha)	32.7439	21.6870
Wadi Susa	Jabel Al Akhdar (Soussa)	32.8821	21.9612
Wadi Zaza (in front of the Plateau)	Benghazi	32.0057	20.3681