The genus *Jaton* (Muricidae, Ocenebrinae), with the description of a new species from Angola, West Africa

El género *Jaton* (Muricidae, Ocenebrinae), con la descripción de una nueva especie de Angola, África occidental

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ABSTRACT

The ocenebrine muricid genus *Jaton* Pusch, 1837, comprises a distinctive group of Late Oligocene to Recent species from the eastern warm-temperate Atlantic. The three living species, all from West Africa, are *J. decussatus* (Gmelin, 1791) from Mauritania and Senegal (type of the genus), *J. flavidus* (Jousseaume, 1874) from Senegal, and *J. sinespina* n. sp. from Angola. Of the fossil and living species, *J. decussatus* is the only one with a labral spine, which is formed at the edge of the outer lip as an extension of a spiral cord.

RESUMEN

El género *Jaton* Pusch, 1837 (Muricidae, Ocenebrinae) incluye a un distintivo grupo de especies del Oligoceno tardío y recientes, todas ellas de aguas cálidas del Atlántico este. Las tres especies vivientes, todas del África occidental, son *J. decussatus* (Gmelin, 1791) de Mauritania y Senegal (tipo del género), *J. flavidus* (Jousseaume, 1874) de Senegal, y *J. sinespina* spec. nov. de Angola. Tanto de las especies fósiles como de las vivientes, *J. decussatus* es la única con una espina labral, localizada en el borde del labio externo como una extensión de una cuerda espiral.

KEY WORDS: Gastropoda, Muricidae, *Jaton*, revision, geological history.
PALABRAS CLAVE: Gastropoda, Muricidae, *Jaton*, revisión, historia geológica.

INTRODUCTION

Species of *Jaton* comprise a distinctive group of eastern Atlantic ocenebrine muricid gastropods characterized by the presence of three thick, rounded varices on the last whorl, by having strongly shouldered whorls, and by having a broad, sealed siphonal canal. One species, *J. decussatus* (Gmelin, 1791) has a small labral spine at the edge of the outer lip. Our purpose in this paper is to revise the Recent species, to describe a new species from Angola, and to outline the previously undocumented geological history of the genus.

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Abbreviations:

MHNG: Muséum d'Histoire Naturelle, Geneva, Switzerland.

MNHN: Muséum National d'Histoire Naturelle, Paris, France.

USNM: National Museum of Natural History, Washington, D. C., U. S. A.

RESULTS

Family MURICIDAE Rafinesque, 1815
Subfamily OCENEBRINAE Cossmann, 1903
Genus *Jaton* Pusch, 1837

Type species: *Murex decussatus* Gmelin, 1791

Remarks: Shells belonging to the genus *Jaton* are characterized by having three thick, usually rounded varices on the last two or three whorls. Intervarical sculpture consists of a prominent node, which on its right (or adapertural) side is adorned with two strong, rounded, divergent cords. The upper of these two cords forms the strong shoulder. In the type species *J. decussatus* (Gmelin, 1791), a third cord, abapically of the node, extends across the varix to form a small labral tooth or spine at the edge of the outer lip. Three or four much finer cords ornament the varices below the abapical termination of the intervarical node. Varices on adjacent whorls are connected across the suture by a strong continuous buttress. The broad siphonal canal is sealed. The apertural varix extends as a wing nearly to the recurved tip of the siphonal canal. The inner side of the outer lip is usually smooth, but in the fossil *J. dufrenoyi* (Grateloup, 1847) and in *J. flavidus* (Jousseaume, 1874) there may be six weak denticles. An umbilical slit is absent.

Jaton is one of several closely related genera comprising a group of ocenebrines with a sealed anterior siphonal canal and a trivaricate shell. Other members in this group include *Calcitrapessa* Berry, 1959; *Ceratostoma* Herrmannsen, 1846; *Microrhytis* Emerson, 1959; *Poropteron* Jousseaume, 1880; and *Pteropurpura* Jousseaume, 1880; as well as a subgenus of *Pteropurpura* to be proposed by G. J. Vermeij and E. H. Vokes for the Late Oligocene *Tritonalia festivoidea* Vokes, 1963, from North Carolina. *Jaton* is unique in having two divergent cords on the right (adapertural) side of each intervarical node. In the Recent South African *Poropteron*, two cords cross each intervarical node, and the varices are scalloped by these and two additional, more basally (abapically) situated, cords. Three or more cords adorn the intervarical nodes in *Ceratostoma* (Early Miocene to Recent of the North Pacific, Early to Middle Miocene of Europe and eastern North America, Pliocene of Ecuador), *Microrhytis* (Early to Late Miocene of tropical America), and *Pteropurpura* (Early Miocene to Recent of the eastern Atlantic, Pliocene to Recent of tropical America, Pliocene to Recent of the North Pacific). A single, heavy cord adorn the intervarical node in *Calcitrapessa* (Miocene of Belgium and Recent of the eastern Pacific). The varices on adjacent whorls are consistently connected in *Jaton* by a thick buttress across the suture. In the other taxa mentioned above, varices of adjacent whorls often do not meet at the suture. The labral spine of *Jaton decussatus* is formed as an extension of the abapical cord, just below the intervarical node. In *Ceratostoma* and *Microrhytis*, by contrast, the labral spine is formed at the end of a groove situated below the abapical termination of the intervarical node. This is also the situation in the Pliocene South African genus *Namamurex* Carrington and Kensley, 1969. *Namamurex* further differs from *Jaton* and the other genera discussed above

by having an open siphonal canal. It may be very closely related to the Late Oligocene to Pliocene European genus *Pterynopsis* Vokes, 1972, another group with an open canal, but species of *Pterynopsis* consistently lack a labral spine.

We recognize three living species of *Jaton*, all from the coasts of West Africa. These are *J. decussatus* (Gmelin, 1791) and *J. flavidus* (Jousseaume, 1874) from Mauritania and Senegal, and *J. sinespina* n. sp. from Angola.

Jaton decussatus (Gmelin, 1791) (Figs 6, 10-11, 13)

Murex decussatus Gmelin, 1791, *Syst. Nat.*, ed. 13: 3527.
Murex jatonus Lamarck, 1816, *Tabl. Encycl. Méth.*, 23: pl. 418, fig. 1.
Murex hemitripterus Lamarck, 1816, *Tabl. Encycl. Méth.*, 23: pl. 418, fig. 4.
Murex lingua Dillwyn, 1817, *Desc. cat. Rec. Shells*, 2: 688.
Murex gibbosus Lamarck, 1822, *Hist. nat. anim. s. vert.*, 7: 166.
Murex linguavervecina Reeve, 1845, *Conch. Iconica*, 3: pl. 27, fig. 121.

Type material: *M. decussatus*: based on several references, including Adanson (1757 "le Jatou"), of which 7 adult shells and one juvenile are in MNHN (Fischer-Piette, 1942: 223); *M. hemitripterus*: 2 possible syntypes MNHN; *M. gibbosus*: 3 possible syntypes MHNG; *M. jatonus*, *M. lingua* and *M. linguavervecina*: not localized.
Type localities: *M. decussatus* and *M. lingua*: West Africa; *M. gibbosus*: Cap Vert, near Gorée Island; *M. linguavervecina*: Gorée, Senegal, 59 m; *M. jatonus* and *M. hemitripterus*: unknown.

Remarks: *Jaton decussatus* is characterized by the presence of a short labral spine, which arises as an extension of the lower cord as it crosses the apertural varix from the right (adapertural) side of the intervarical node. The species resembles *J. flavidus* in having a low spire, but it differs by having weaker spiral sculpture, by possessing a labral spine, and by having much less spinose varices. The shell is brown or white with light or dark brown blotches and reaches an adult length of 30 to 53 mm. At Dakar, one of us (GJV) has found it living in the infralittoral fringe, where it co-occurs with *Ocenebra inermicosta* Vokes, 1964. Evidently, *J. decussatus* occupies somewhat shallower habitats than does *J. flavidus*.

Distribution: From Northern Mauritania to Dakar, Senegal, on infralittoral rocks, to 10 m depth. The depth of 59 m indicated by REEVE (1845) is probably erroneous or based on a empty shell.

Jaton flavidus (Jousseaume, 1874) (Figs 7-8, 14)

Murex flavidus Jousseaume, 1874, *Rev. Mag. Zool.*, 3: 8.
Murex rusticus Jousseaume, 1874, *Rev. Mag. Zool.*, 3: pl. 1, fig. 7-8.

Type material: holotype MNHN.
Type locality: unknown.

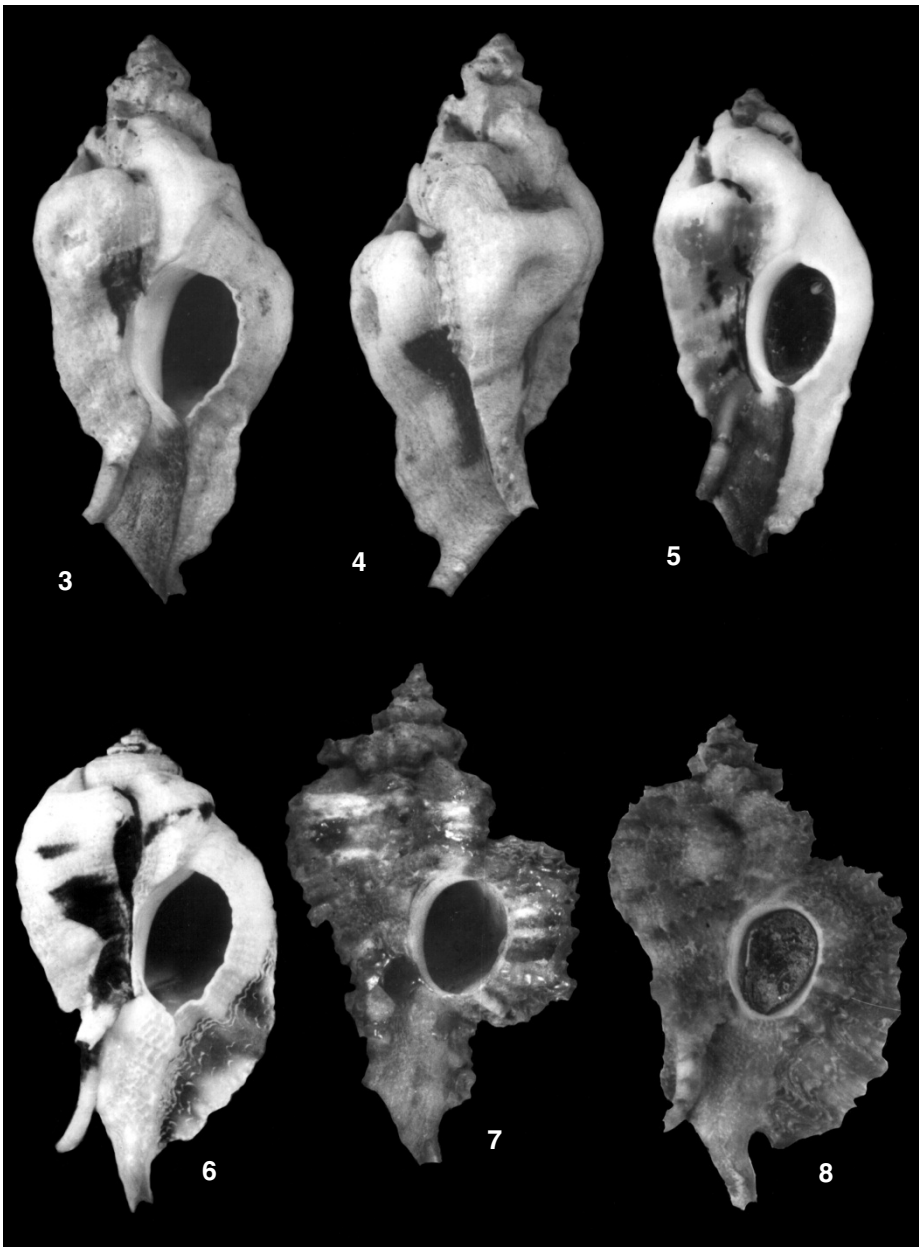
Remarks: JOUSSEAUME (1874) described (as *Murex flavidus*) and illustrated (as *M. rusticus*) a single shell. Nevertheless, two specimens in MNHN are labeled as "types", one of which was probably added by Jousseaume after the description had been published. This second specimen, which is not to be considered a type, was erroneously figured by FAIR (1976, pl. 23, fig. 362) as the type of *M. flavidus*.

Jaton flavidus is characterized by a shouldered shell with strong spiral cords, a denticulate outer lip, squamose texture, and spinose varices. It resembles *J. decussatus* in having a low spire,

Figures 1-2. *Jaton sinespina* n. sp., holotype MNHN, Angola, Prov. Moçamedes, Lucira (Praia do Cesar), infralittoral rocks, 50.3 mm.
Figuras 1-2. Jaton sinespina *spec. nov., holotipo MNHN, Angola, Prov. Moçamedes, Lucira (Praia do Cesar), rocas infralitorales, 50,3 mm*.

but differs in many aspects (see under *J. decussatus*). The Pliocene *J. helenae* (Landau, 1984) is very similar to *J. flavidus* in having a low spire, but differs in having obsolete rather than strong spiral cords and in having sharp blade-like rather than thicker, more rounded, spinose varices. The shell of *J. flavidus* is uniformly brown, often with reddish-brown spots. The species is known only from near Dakar, Senegal, where it occupies slightly deeper habitats than *J. decussatus*.

Distribution: Only known from Senegal, in the vicinity of Dakar, 5-36 m.



Figures 3-5. *Jaton sinespina* n. sp. 3-4: Angola, Prov. Benguela, Bay of Santa Maria, 52.1 mm, paratype MNHN. 5: Angola, Benguela, 42.6 mm, paratype, P. Ryall *coll*. Figure 6. *J. decussatus* (Gmelin, 1791), Gorée, Senegal, 35.8 mm, R. Houart *coll*. Figures 7-8. *J. flavidus* (Jousseaume, 1874). 7: holotype MNHN, 37.5 mm; 8: Gorée, Senegal, 36.5 mm, R. Houart *coll*.
Figuras 3-5. Jaton sinespina *spec. nov. 3-4: Angola, Prov. Benguela, Bahía de Santa María, 52,1 mm, paratipo MNHN. 5: Angola, Benguela, 42,6 mm, paratipo, P. Ryall* coll. *Figura 6*. J. decussatus *(Gmelin, 1791), Gorée, Senegal, 35,8 mm, R. Houart* coll. *Figuras 7-8*. J. flavidus *(Jousseaume, 1874). 7: holotipo MNHN, 37,5 mm; 8: Gorée, Senegal, 36,5 mm, R. Houart* coll.

Jaton sinespina n. sp. (Figs 1-5, 9, 12)

Type material: Holotype and 4 paratypes MNHN, 1 paratype NM L1846/T1358, 1 paratype coll. R. Houart, Angola, Prov. Moçamedes, Lucira (Praia do Cesar), infralittoral rocks. Other paratypes: Prov. Benguela, 1 paratype coll. P. Ryall; Prov. Benguela, Baia de Santa Maria, rocks, 0-2 m, 2 MNHN; Baia do Limagen, rocks, 0-2 m, 2 MNHN, 1 USNM 880155.
Other material examined: Prov. Moçâmedes, Praia Amelia, infralittoral rocks, 43 MNHN; Benguela, 2 coll. R. Houart; South Angola, 10 coll. P. Ryall.
Etymology: without spine (Latin), in connection with the absence of a labral spine.

Description: Shell up to 52.1 mm in length at maturity (paratype MNHN), heavy, shouldered. Spire high with 2 protoconch whorls and up to 6 relatively narrow, strongly shouldered teleoconch whorls. Suture impressed. Steep subsutural ramp. Protoconch high, whorls smooth, weakly keeled. Terminal varix unknown (eroded).

Axial sculpture of first to third teleoconch whorls consisting of 7 or 8 low lamellae; from fourth to last teleoconch whorls presence of 3 broad, thick varices, connected on preceding whorls by a broad, flat, large buttress. Last whorl with a thin, bladelike expansion abapically, extending to $^3/_4$ of siphonal canal. Intervarical axial sculpture of a single, broad, thick knob, connecting preceding varix on shoulder. Other axial sculpture of numerous, frilly, growth lamellae. Spiral sculpture of two strong, broad cords, and of weak, squamous threads of various strength, more obvious on outer edge of varices.

Aperture large, ovate. Columellar lip smooth, rim adherent. Anal notch narrow, weak, almost indistinct. Outer lip serrate, smooth within. Siphonal canal moderately long, $^2/_5$ of total shell length, broad, sealed.

White with black blotches near varices and on shoulder. Operculum dark brown, ovate, with subterminal nucleus. Radula typical ocenebrine with a strongly projecting central cusp, long lateral cusps with small inner lateral denticle, 3 or 4 marginal denticles, and long marginal cusp. Lateral tooth sickle shaped, slender.

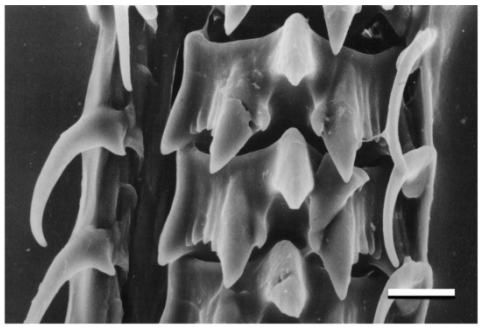
Distribution: Angola, from Moçamedes Bay to South of Benguela, on infralittoral rocks, 0-10 m.

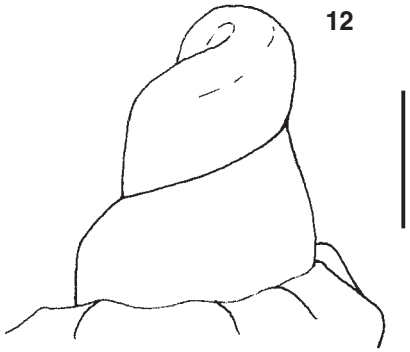
Remarks: *Jaton sinespina* n. sp. differs from *J. decussatus* and *J. flavidus* in having a higher spire. Its varices are thicker, and its aperture is relatively larger than that of the other two Recent species. It differs further from *J. decussatus* in the consistent absence of a labral spine, and from *J. flavidus* by a less spinose shell. Some of these differences were already observed by RYALL (1984), who proposed the name *Jaton decussatus* var. *angolensis* for this taxon. His name is, however, nomenclatorially unavailable (ICZN Article 16). *J. sinespina* is very similar to the Miocene *J. sowerbyi* (Michelotti, 1841) and *J. dufrenoyi* (Grateloup, 1847) in having a high spire, but the latter two species have stronger basal spiral cords.

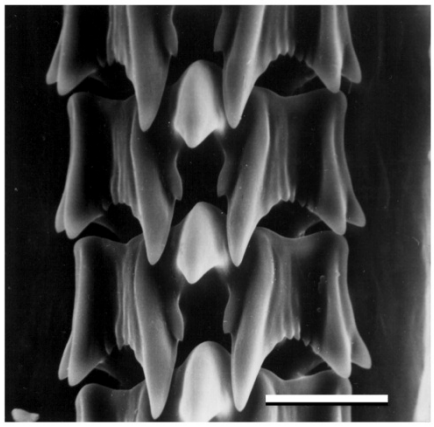
DISCUSSION

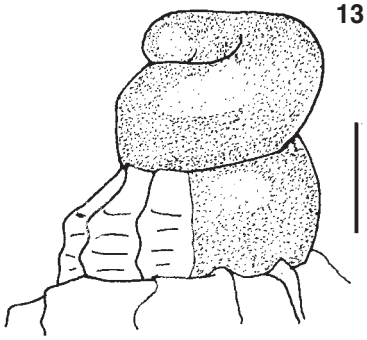
Some four thousand kilometers of coastline separate the northern two species from the southern *J. sinespina*. This distributional gap implies that the genus was at one time distributed along the whole of the West African coast. Such a supposition is supported by BRÉBION'S (1979) report of *J. decussatus* from the Harounian (Late Pleistocene) of Morocco, an area well to the north of the current distributional limits of that species. The present distribution of *Jaton* appears to be relictual, as is true for numerous other West African molluscs.

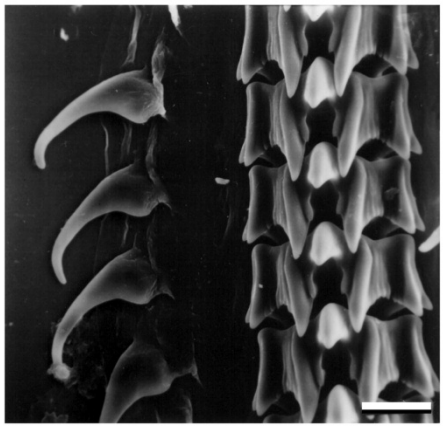
Surprisingly, the genus *Jaton* has not hitherto been recognized in the fossil record from Europe. Nevertheless, several species clearly belong to *Jaton* on

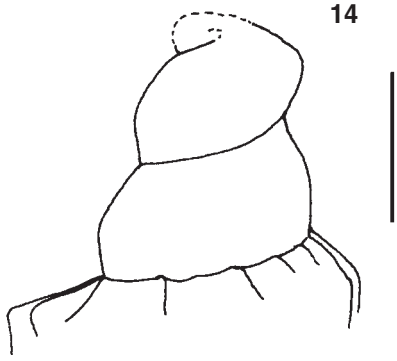












Figures 9-11. Radulae. 9: *Jaton sinespina* (paratype MNHN); 10-11: *J. decussatus* (MNHN). Figures 12-14. Protoconchs. 12: *Jaton sinespina* n. sp.; 13: *J. decussatus*; 14: *J. flavidus*. Scale bars, 9-11: 20 μm; 12-14: 0.5 mm.

Figuras 9-11. Radulas. 9: Jaton sinespina *(paratipo MNHN); 10-11:* J. decussatus *(MNHN). Figuras 12-14. Protoconchas. 12:* Jaton sinespina *spec. nov.; 13:* J. decussatus*; 14:* J. flavidus. *Escalas, 9-11: 20 µm; 12-14: 0,5 mm.*

the basis of the distinctive diverging cords on the adapertural side of the intervarical nodes. The oldest of these is *J. dufrenoyi* (Grateloup, 1847) from the Late Oligocene and Early Miocene (Aquitanian and Burdigalian) of southwestern France. This species resembles the Recent Angolan *J. sinespina* n. sp. in having a high spire. The inner side of the outer lip bears six weak denticles. In specimens from Arrié (Aquitanian) and Peloua (Burdigalian) (MNHN), two basal crenations on the edge of the outer lip appear slightly enlarged, but there is no evidence that these crenations are the remnants of a true labral spine. The Late Miocene *J. sowerbyi* (Michelotti, 1841) from the Middle Miocene of the Viena Basin and the Late Miocene of Italy is very similar to *J. dufrenoyi*. It is characterized by a medium-high spire, strong spiral sculpture of four primary cords (two on the adapertural side of the intervarical nodes and two basal cords) as well as secondary cords, the absence of a labral spine, and the absence of denticles on the inner side of the outer lip (based on material in the Mayer-Eymar collection, Naturhistorich Museum Basel). During the Pliocene, *Jaton* was represented by *J. helenae* (Landau, 1984), from the Zanclian (Early Pliocene) of the province of Huelva, Spain. This species has a low spire, as do the Recent *J. flavidus* and *J. decussatus*, but again there is no evidence of a labral spine. The lower of the two cords on the right side of the intervarical nodes in *J. helenae* is relatively poorly expressed, and basal cords are obsolete. LANDAU (1984) originally described this species as a *Purpurellus* Jousseaume, 1880, but the Spanish fossil is much less spiny than are species of the muricine genus *Purpurellus*, and the spiral sculpture is very different. Further research is likely to uncover other nominal fossil species of *Jaton* among the numerous species of *Ocenebra* that have been named from the Miocene and Pliocene of Europe.

The available evidence therefore implies that *Jaton* originated during the Late Oligocene, and that it existed in subtropical European seas from that time until at least the Early Pliocene. The evolution of the labral spine in *J. decussatus* may be a relatively recent event. This species is known fossil only from the Late Pleistocene of Morocco. Its relationships to other Recent and fossil species of *Jaton* remains unresolved. It shares with *J. helenae* and *J. flavidus* the relatively low spire. The Angolan *J. sinespina* may be more closely related to the older *J. sowerbyi* and *J. dufrenoyi*, all three species having a moderately high spire. Because the phyletic relationships among the fossil and living *Jaton* remain unresolved, we have chosen to treat the three living populations as distinct species rather than as subspecies.

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