

Near Capuy, Santo Domingo. Type 169741 ANSP., others in the Maxwell Smith collection.

The snail is closely related to *U. olssoni* Pils. from Monte Cristo, but it is less glossy and differs by having the columellar axis decidedly thickened in the later whorls. In *U. olssoni* it is thin throughout. Fewer whorls have been lost at the summit than in *olssoni*. While the base does not have a carina as in typical *Autocoptis*, there are often several low spiral welts on the last whorl.

EUGLANDINA BALESI, n. sp.

Puerto Marquez, south of Acapulco, Mexico, among leaves under mango trees. Type 170440 ANSP., collected by Dr. B. R. Bales, 1938; other specimens in the Bales collection.

Shell similar in general appearance to *E. turris* (Pfr.), cinnamon colored glossy, with straight-sided spire not attenuated towards the obtuse apex. The first three whorls are smooth, striae then beginning, at first weak, but becoming rather strong regular and smooth on the later whorls. They do not unite by pairs or pass over the sutural margination, and there is no spiral sculpture. From the fourth whorl on there is a very distinct, nearly smooth, seam-like subsutural margin defined by a groove, and about 0.25 mm. wide on the last whorl. The aperture occupies less than half of the total length. Columella evenly arched, without a callous edge.

Length 35.4 mm., diam. 13.6 mm., aperture 16 mm.; 7 whorls. Type.

Length 35.1 mm., diam. 14.2 mm., aperture 18 mm.; 6½ whorls.

Chiefly characterized by the smooth striation and very distinct sutural margin. The second specimen measured differs from the type by the somewhat larger aperture and by having the columella straight. It will be illustrated in the next number of NAUTILUS.

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## BUSYCON CARICA (GMELIN) AS A GENOTYPE

BY BURNETT SMITH

The genus *Busycon*, usually attributed to Bolten, was first proposed by Röding.<sup>1</sup> Six species are given: *Busycon muricatum* or

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<sup>1</sup> Röding, Peter Friedrich: Museum Boltenianus sive Catalogus cimeliorum e tribus regnis naturæ quæ olim collegerat. Pars Secunda continens Conchylia sive Testacea univalvia, bivalvia & multivalvia. Pp. VIII, 199. 1798. Reprint. See p. 149.



the *Murex carica* of Gmelin, *B. perversum*, *B. dubium*, *B. cingulatum*, *B. inversum*, and *B. canaliculatum*. The species *dubium*, *cingulatum*, and *inversum* are not referred to figures and are therefore not identifiable. This restricts a discussion of the nomenclature to the three species *muricatum*, *perversum*, and *canaliculatum*. The name *muricatum* given above was used by Lister ("Muricata") but as this writer is pre-Linnæan and not binomial Röding's first listed species will in this paper be called *carica*—its proper designation. The starting point for a nomenclatorial investigation then appears to be *Murex carica* of Gmelin, that is, *Busycon carica* (Gmelin).

*Busycon carica* (Gmelin)

Röding's first species of *Busycon* is listed thus: "*B. Muricatum*. Die stachlige Feige. Gmel. *Murex carica* sp. 67. Mart. 3. t. 67. f. 744. & t. 69. f. 756." The figures Röding cites are also given by Gmelin. A discussion of these figures will be delayed until the first two figure references of Gmelin<sup>2</sup> have been considered. The first reads "*List. Conch.* t. 880. f. 3. b."<sup>3</sup> On consulting the reprint of Lister's work by L. W. Dillwyn (1823) it is found that pl. 880, fig. 3b shows a shell referable to what is now very generally known as *Fulgur* or *Busycon carica*. Good 20th Century figures for comparison with Lister's may be found in the Maryland Geological Survey's report on the Pliocene and Pleistocene, pls. XLIII–XLV.

Gmelin's second figure reference for the species reads "*Gualt. test.* t. 47, fig. B."<sup>4</sup> Gualtieri's figure makes a very fair check with that shown on pl. XLIII of the Maryland report just mentioned and may be accepted as representing the *Fulgur* or *Busycon carica* of modern usage.

Before taking up the remaining figures given by Gmelin it is believed advisable to call attention to the fact that the species now

<sup>2</sup> Gmelin, Jo. Frid.: *Caroli A Linné. Systema Naturae. Tom. I. Pars VI.* For pp. 3021–3910 a statement "1791 before May 14" has been pasted in the volume at the Academy of Natural Sciences of Philadelphia. See p. 3545.

<sup>3</sup> Lister, Martini: *Historia Sive Synopsis Methodica Conchyliorum*, pl. 880, fig. 3b.

<sup>4</sup> Gualtieri, Nicolai: *Index Testarum Conchyliorum. Florentiae. 1742.* See pl. 47, fig. B.



being considered was erroneously included by Linnæus<sup>5</sup> in his *Murex aruanus*. This description is "M. testa patulo-caudata, spira spinoso-coronata." The references given are "*Rumph. mus. t. 28. f. A.*" and "*Gvalt. test. t. 47. f. B.*" The description, if so it may be termed, is concluded with "*Habitat ad Novam Guineam.*" The figure given by Rumphius<sup>6</sup> shows the well-known *Megala-tractus aruanus* (Linn.) reversed in the process of illustration. In a discussion of this last named species Hedley<sup>7</sup> says "Hanley has shown (*Ipsa Linnæi Conchyliæ*, 1855, p. 301, and *Journ. Linn. Soc. Zool.* iv. 1860, p. 78) that the Linnean species *Murex aruanus* referred by nomenclature, description and bibliography to two species. One, an American shell, was separated in 1788 from *aruanus* by Gmelin as *Murex carica*. The other, an Australian shell, was renamed *Fusus probosciferus* by Lamarck in 1822." The incongruity of applying the specific name "*aruanus*" to the American shell is noted by Hedley. He further argues "that as the Linnean designation covered two species, the proper course to adopt is to accept the first revision—in this case Gmelin's." The present writer is in complete accord with Hedley's views and favors the retention of the term "*carica*" for the American shell.

The injection of the term "*aruanus*" into the discussion would indeed be of secondary importance were it not that a number of authors<sup>8</sup> have favored its use for the American shell. Two at least have selected *Murex aruanus* as the type species of *Busycon*. Such a type selection for *Busycon* is precluded by the fact that

<sup>5</sup> Linnæi, Caroli: *Systema Naturæ*. Tomus I. Editio Decima, Reformata. 1758. See p. 753.

<sup>6</sup> Rumphius, Georgius Everhardus: *D'Amboinsche Rariteitkamer*. 1705. See pl. XXVIII, fig. A.

<sup>7</sup> Hedley, Charles: *Studies on Australian Mollusca*. Part I. *Proc. Linn. Soc. N.S.W.*, 1900, Part 1, April 25th. Pp. 87-100, pls. III, IV. See p. 98.

<sup>8</sup> Herrmannsen, A. N.: *Indicis Generum Malacozoorum Primordia*. Vol. I. 1846. See pp. 148, 149.

Gray, John E.: *A List of the Genera of Recent Mollusca, their Synonyma and Types*. *Proc. Zool. Soc. London*. Part XV. 1847. See p. 135.

Hanley, Sylvanus: *Ipsa Linnæi Conchyliæ*. London, 1855. See pp. 301, 302.

Hanley, Sylvanus: *On the Linnean Manuscript of the 'Museum Ulricæ.'* *Journal of the Proceedings of the Linnean Society*. Zoology IV. London, 1860. See p. 78.



*Murex aruanus* was not one of the original species of *Busycon* occurring in Röding's list. Before Röding's list appeared *Murex carica* had already been removed by Gmelin from the *Murex aruanus* of Linnæus. The second figure reference of Linnæus (10th Edition) and the second figure reference of Gmelin are identical.

Returning now to the remaining figures cited by Gmelin it is found that Knorr figured *Busycon eliceans* (Montfort) and that Martini figured not only *B. carica* and *B. eliceans* but *Galeodes morio* (L.) as well.

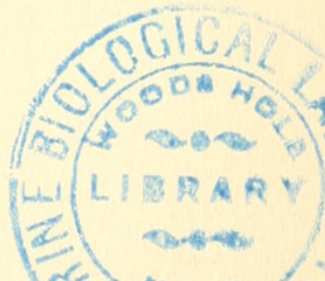
These figures may now be taken up in detail. Gmelin, in addition to references already considered, give next "*Knorr Vergn.* 1. t. 30. f. 4. et 6. t. 27. f. 1."<sup>9</sup> The first figure given should read 1 and not 4. This figure is poor but shows what is rather surely not the accepted *Busycon carica*. The subject is too spinose. The date of this figure is 1757. The second figure represents an immature individual of the *Fulgur eliceans* of Montfort.<sup>10</sup> The date of this figure is 1772.

Gmelin's fourth and last citation is "*Martin. Conch.* 3. t. 67. f. 744. et t. 69. f. 756.757."<sup>11</sup> Figure 744 represents *Fulgur eliceans* Montfort while figure 756 shows what is ordinarily called *Fulgur* or *Busycon carica* and is well illustrated as noted before in the Maryland Geological Survey's report on the Pliocene and Pleistocene (Pls. XLIII-XLV). Figure 757 does not represent a *Busycon* or *Fulgur* but shows *Galeodes morio* (Linn.) which antedates the work of Gmelin and is automatically ruled out of his *Murex carica*. Montfort by describing *Fulgur eliceans* in 1810 has thereby left the *Murex carica* of Gmelin a homogeneous species. This homogeneous species is *Busycon carica* (Gmelin), that is, the *Fulgur carica* (Gmelin) so well illustrated in the Maryland report just noted.

<sup>9</sup> Knorr, Georg Wolfgang: Vergnügen der Augen und des Gemüthes in Vorstellung einer allgemeinen Sammlung von Muscheln und andern Geschöpfen welche im Meer gefunden werden. Nürnberg. 4 vols. and 6 parts. 1757-1772.

<sup>10</sup> Montfort, Denys De: Conchyliologie Systématique. Tome Second. Paris, 1810. See pp. 502-504, fig. on p. 502.

<sup>11</sup> Martini, Friedrich Heinrich Wilhelm: Neues Systematisches Conchylien-Cabinet. III Band Nürnberg, 1777.





Homogeneous, well defined, common, and the first species of *Busycon* given by Röding, *Murex carica* Gmelin, that is, *Busycon carica* (Gmelin), would appear on these grounds alone to make an ideal type species for the genus *Busycon*. Furthermore, the name *Busycon carica* appears to have the protection of the "absolute tautonymy" rule.<sup>12</sup> The present writer has so far failed to discover that any author subsequent to Röding has selected or designated one of the original species of *Busycon* as the type of the genus. The name *carica* has a number of times been mentioned as that of the first species of *Busycon*.<sup>13</sup> Such mention, however, does not constitute a selection or designation of the type species of the genus *Busycon*. In the hope of clarifying the situation, fixing a reasonable genotype, and reinforcing the protection of tautonymy this is now being done according to the following statement: *Busycon* Röding [Bolten], Museum Boltenianum, 1798, p. 149: type, *Murex carica* Gmelin.

*Fulgur* is the most important synonym for *Busycon*. The type species of *Fulgur* is *Fulgur eliceans* Montfort. Although Montfort cites "*Murex perversus*" in his synonymy the genus is really monotypic. This makes erroneous Cossmann's assertion that "*Murex perversus*, Lin." is the type of *Fulgur*.<sup>14</sup>

In the preparation of these notes the writer has had the benefit of advice from the following specialists—Dr. Katherine V. W. Palmer, Dr. H. Burrington Baker, and Dr. Henry A. Pilsbry.

<sup>12</sup> Schenk, Edward T. and John H. McMasters: Procedure in Taxonomy. Stanford University Press. 1936(?). See p. 34.

<sup>13</sup> Dall, William Healey: Early History of the Generic Name *Fusus*. Journal of Conchology. April 1906. See p. 296. This is more correctly a reference to *Fulgur eliceans* Montfort, although the word "*carica*" is used by Dall.

Dall, William Healey: A Monograph of the Molluscan Fauna of the Orthaulax pugnax Zone of the Oligocene of Tampa, Florida. U. S. Nat. Mus., Bul. 90, 1915. See p. 66. The word "*carica*" is used but the reference is really to *Fulgur eliceans* Montfort.

Wade, Bruce: An Upper Cretaceous *Fulgur*. Am. Journ. Sci., 4 ser., XLIII, 1917, p. 294. The word "*carica*" is used but the reference is to *Fulgur eliceans* Montfort.

Wade, Bruce: The Fauna of the Ripley Formation on Coon Creek, Tennessee. U. S. G. S. Prof. Paper 137. 1926. See p. 137. Type of *Protobusycon* but not of *Busycon* designated.

<sup>14</sup> Cossmann, M.: Essais de Paléoconchologie Comparée. Livr. 4. 1901. See p. 76.



Smith, B. 1938. "Busycon carica (Gmelin) as a genotype." *The Nautilus* 52, 16–20.

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