

## Species of the genus *Sigalion* (Annelida : Polychaeta) reported from north-west European waters, with a note on the authorship of the generic name

A.I. Muir

Department of Zoology, British Museum (Natural History),  
London SW7 5BD, United Kingdom.

**Abstract :** An attempt is made to elucidate the chronology of certain publications by Cuvier, Delle Chiaje and Audouin & Edwards. The type species of the genus *Sigalion* Audouin & Edwards in Cuvier, 1830, is *Sigalion mathildae* Audouin & Edwards in Cuvier, 1830. *S. mathildae* and *S. squamosum* Delle Chiaje, 1830, are the only currently recognized species of *Sigalion* found off north-western Europe. The name *Sigalion squamatum* is not valid for any species.

**Résumé :** On essaie d'élucider la chronologie de certaines publications de Cuvier, Delle Chiaje et Audouin & Edwards. L'espèce-type du genre *Sigalion* Audouin & Edwards chez Cuvier, 1830, est *Sigalion mathildae* Audouin & Edwards chez Cuvier, 1830. *S. mathildae* et *S. squamosum* Delle Chiaje, 1830, sont les seules espèces de *Sigalion* reconnues des mers du Nord-Ouest de l'Europe. Le nom *Sigalion squamatum* n'est valide pour aucune espèce.

### INTRODUCTION

The genus *Sigalion* is commonly reported from north-west European seas (i. e. waters less than 200 metres deep from Norway to the Gulf of Gascony and including the North Sea and English Channel), often in the combination *Sigalion squamatum*, although several other combinations have been noted in the literature. During the course of a review of the scale worms of the continental shelf of north-west Europe (Chambers & Muir, in prep.) it became necessary to elucidate the authorship, and where possible the identity, of the species referred to by these names. The results of these investigations are presented here.

### THE GENUS *Sigalion*

The early bibliographic history of the genus *Sigalion* is complicated, and has led to some confusion over authorship and type species.

The name *Sigalion* was probably first published by Cuvier (1830a p.207) as "Les Sigalions, Aud. et Miln. Edw.", followed by a brief comparison with the other genera of scale worms. The phrase "Aud. et Miln. Edw." is a reference to Audouin & Edwards, 1834. There is a manuscript note in the British Museum (Natural History) copy of Audouin & Edwards (1834) saying "This vol. II of Audouin & Milne Edwards Littoral de la France is a mere resetting of the series of papers in *Ann Sci. Nat.* ser. 1, vols XXVII-XXX. 1832-1833.

There are no additions or corrections. C Davies Sherborn. Dec. 2, 1896.” The first full description of the genus was thus published by Audouin & Edwards, 1832, which has a reference back to Audouin & Edwards in Cuvier, 1830a.

Cuvier, Audouin and Edwards all worked at the “Muséum National d’Histoire Naturelle”, Paris, and were members of the Academy of Sciences of the Institute of France, at roughly the same time. Cuvier (1830b, reprinted with slight changes as Cuvier *et al* 1921), in the proceedings of the Academy for the 15<sup>th</sup>. of November 1830, states that the genus *Sigalion* was created by Audouin & Edwards in a manuscript read to the Academy or deposited in its office on the 19<sup>th</sup>. of July or the 23<sup>rd</sup>. of November 1829, but published by Cuvier in the second edition of the *Règne animal*. The title of this manuscript by Audouin & Edwards was, in fact, mentioned in the minutes of the meeting of the 20<sup>th</sup> of July 1829. Neave (1940) stated the authorship of *Sigalion* to be Audouin and Milne-Edwards, 1829, probably following Sherborn (1930). However, neither the deposit of a document, nor a mention at a meeting, constitute publication (Article 9, International Commission on Zoological Nomenclature, 1985).

Delle Chiaje (1841 volume 5) credited the name *Sigalion* to Edwards in Audouin & Edwards (1932). Delle Chiaje (1841) did not mention one of his own earlier works, *Memorie sulla storia e notomia degli animali senza vertebre del Regno di Napoli*. This latter work is usually cited as Delle Chiaje (1822), and it names and figures *Sigalion arenosum* on plate 80 (Fig. 4, 5, 16, 18 & 22) and *Sigalion squamosum* on plate 96 (Fig. 3, 11 & 12). These plates were republished in Delle Chiaje, 1841 (plate 80 renumbered 98, plate 96 renumbered 26). The dates of publication of the *Memorie* have been deduced to be as follows by Sherborn (1922) and Zibrowius (1972) :

<i>Memorie</i>	Sherborn		Zibrowius
vol.1(1) : 1-84	1823	}	1823
vol.1.(2) : 1-183	1824		
vol.2 : 185-224	1825	}	1825
vol.2 : 225-444	1827		
vol.3 : 1-232	1828		1828
vol.4 : 1-116	1830	}	1829
vol.4 : 117-214	1831		
plates 70-109	1830	Atlas	1822

The British Museum (Natural History) library only has plates 1-69. Both Sherborn (1922) and Oken (1832) imply that these plates were issued with the appropriate parts of the text. Plates 70-109 belong to volumes 5 and 6 of the text, which were never published.

Oken (1836) recorded the publishing of these plates but did not give a date. In a footnote on p.XIII of the *Descrizione* volume 1, Delle Chiaje states that he had 1830 engraved on plates 70 to 109 of the *Memorie* to fix the dates of publication. In their renumbered form in the *Descrizione* most of them are dated as being engraved in 1830. Plates 81 and 86, renumbered 165 and 72 in Delle Chiaje, 1841, are undated. Plate 103 is not renumbered but is dated 1839 - it is possible this plate had been altered or added to before being republished. It must be presumed that the *Sigalion* plates were probably published in 1830.

The *Descrizione* was also issued in parts, as follows (Sherborn, 1922) :

vol.1 : I-XIX & 1-98	1841
vol.2 : 5-146	1841
vol.3 : 5-142	1841
vol.4 : 1-142	1841
vol.5 : 5-165	1841
vol.6 plates 1-86	1841
vol.7 plates 87-173	1841
vol.8 : 5-48	1844
plates 174-181	1844

Plates 174-181 were probably issued with volume 8 (the appendix etc.), but in the British Museum (Natural History) copy of the work they are bound together with the other plates.

Volume 3 of the second edition of Cuvier's *Règne animal* was published in March 1830 (Sherborn, 1922), which means it probably came out before the *Sigalion* plates in Delle Chiaje (1823-31). As Delle Chiaje (1841) himself credits the name *Sigalion* to Edwards in Audouin & Edwards (1832), it would be best to consider the name to have been first published by Audouin & Edwards in Cuvier, 1830a.

#### SPECIES FROM NORTH-WEST EUROPEAN WATERS

*Sigalion boa* Johnston, 1833 = *Sthenelais boa* (Johnston, 1833).

This species, with the type locality of Berwick Bay on the North Sea coast of Britain, was transferred to the genus *Sthenelais* by Quatrefages (1865). *Sthenelais* has three antennae, while *Sigalion* only has two lateral antennae. *Sigalion* has dorsal cirri on the third chaetiger, while *Sthenelais* has not. The species is widely reported from the Atlantic and Indo-Pacific areas and this transfer has been followed by most more recent authors (e. g. McIntosh (1900), Fauvel (1923) and Hartmann-Schröder (1971)).

*Sigalion buskii* McIntosh, 1876 = *Sigalion squamosum* Delle Chiaje, 1830.

The species was originally dredged in 90 fathoms off North Unst, Shetlands, but has also been reported from the Dunoon Basin (western Scotland) by Chumley (1918). Neither of

these specimens can now be located, but the published descriptions (by McIntosh, 1869 as *Sthenelais dendrolepis* Claparède, 1868 and by McIntosh, 1876, 1900 as *Sigalion buskii*) fit *Sigalion squamosum*, so *S. buskii* should be considered a junior synonym.

*Sigalion carringtonii* Brown in Carrington, 1865 = *Sigalion mathildae* Audouin & Edwards in Cuvier, 1830.

The only recorded specimens were found at Birkdale, Lancashire, on the English coast of the Irish Sea. The description is inadequate, but the type specimens (recently rediscovered in the British Museum (Natural History) - registration number ZB 1969.5) represent specimens of *S. mathildae* in poor condition.

*Sigalion estellae* Guérin, 1833 = *Sthenelais boa* (Johnston, 1833).

This nominal species, with the type locality of La Rochelle on the western coast of France, is, from the description and figures, probably the same species as *Sthenelais boa* Johnston, 1833. The paper by Guérin, 1833 bears the date May 1833. Sherbron (1922, p.LXXXV) expressed doubt about accepting this as the date of publication. It could have been the date the manuscript was completed or the date on which it was submitted to the journal. The paper by Johnston, 1833 is dated 20<sup>th</sup>. of March, but was published in a part dated July 1833. *S. estellae* should be considered a junior synonym of *S. boa* because it has only been reported once while *S. boa* is a well-known species.

*Sigalion herminiae* Audouin & Edwards, 1832 = *Psammolyce* sp.

This species, like the previous one, has the type locality of La Rochelle. It was transferred by Kinberg (1858) to the genus *Psammolyce* since it has a median antenna and no simple neurochaetae, *Sigalion* having no median antenna but having simple as well as compound neurochaetae. It has been recorded from French coasts as *Psammolyce herminiae* by Quatrefages (1865) and Pruvot (1897). None of these specimens can now be located. From the original description, the species is similar to *Psammolyce arenosa* (Delle Chiaje, 1830), and the two were tentatively synonymised by Saint-Joseph (1906). This synonymy was accepted by Rioja (1918) and Fauvel (1923). The elytra of both species have a fringe of long papillae, but while those of *P. arenosa* also have a bulbous projection covered with small papillae (see Fauvel, 1923 Fig. 40), those of *S. herminiae* were described as having small membranous flaps on the margin. *Sigalion herminiae* must, therefore, be regarded as an unidentifiable species of *Psammolyce* until fresh material can be found and described.

*Sigalion idunae* Rathke, 1843 = *Sthenelais boa* (Johnston, 1833).

This species, originally discovered at Molde, Molde Fjord, Norway, has also been recorded as *Sthenelais idunae* by Michaelsen, 1896, from the North Sea and by Saint-Joseph, 1899, from Brittany. From Rathke's description, *S. idunae* is clearly in the genus *Sthenelais* (see section on *Sigalion boa* above), and is probably a junior synonym of *S. boa*.

*Sigalion mathildae* Audouin & Edwards in Cuvier, 1830.

This species was first mentioned in print by Cuvier, 1830a in a footnote on p. 207, and

attributed to Audouin & Edwards (see section on the genus *Sigalion* above). It was not described, but being the only species mentioned would agree with the generic description. This is a sufficient indication to make both the generic and specific names available (Article 12(b)(6), International Commission on Zoological Nomenclature, 1985). It is the type species of the genus by monotypy, and was correctly cited as such by Kinberg (1858).

The species was described in more detail by Audouin & Edwards, 1832, and the type locality was given as the "îles Chausey", western Normandy (English Channel). *Sigalion mathildae* is now known from European coasts from the Kattegat to the Mediterranean, and is also reported from Madagascar in the Indian Ocean (Day, 1967). It is currently being fully redescribed by A. S. Y. Mackie & S. J. Chambers (pers. comm.).

Note that *Sigalion mathildae* Leidy, 1855 from New Jersey is a junior homonym of the above species, and was renamed *Sthenelais leidy* Quatrefages, 1865. It was referred to *Sthenelais boa* (Johnston, 1833) by Pettibone (1963).

*Sigalion squamatum* Delle Chiaje in Claparède, 1868 = *Sigalion mathildae* Audouin & Edwards in Cuvier, 1830 or *Sigalion squamosum* Delle Chiaje, 1830.

*Sigalion squamatum* is an "incorrect subsequent spelling" (Article 33(c), International Commission on Zoological Nomenclature, 1985), introduced into the literature when Claparède (1868) latinised the Italian name (*Sigalio squamato*) of *Sigalion squamosum* Delle Chiaje, 1830, which appeared in Delle Chiaje, 1841 volume 5 pp. 58 & 107.

Specimens from this area mentioned in the literature under the name *S. squamatum* usually turn out to be *S. mathildae*, but the specimen collected by Cabioch (Cabioch *et al.*, 1968) from the Bank ar Forest, near Roscoff, at 60 m, has been examined and is *S. squamosum*. The two most obvious differences between these species are firstly that in *S. mathildae* the bipinnate fringing papillae of the elytra have up to 20 cylindrical sidepieces on each side, while in *S. squamosum* they have up to 9 lanceolate sidepieces on each side, and secondly that while the neuropodia of *S. mathildae* have a stylole dorsally, those of *S. squamosum* do not.

*Sigalion squamosum* Delle Chiaje, 1830.

Although specimens from the area have not been published under this name before now, the specimen of *S. squamatum* from Roscoff collected by Cabioch (Cabioch *et al.*, 1968) has now been identified as this species. The descriptions of *S. buskii* published by McIntosh, 1869, 1876, 1900 (see section on *S. buskii* above) also agree with *S. squamosum*. *S. squamosum* is usually regarded as a Mediterranean species, but as it is now known from Brittany, the Shetlands and possibly western Scotland, it should be looked for in surveys of north-west European waters, where it may turn out to be widespread but rare.

*Sigalion tetragonum* Oersted, 1845 = *Neoleanira tetragonum* (Oersted, 1845).

This species, originally described from Drøbak, Oslofjord, Norway, is reported from the Arctic Ocean, North Atlantic, Mediterranean Sea and off South Africa. It has been removed from the genus *Sigalion* and is currently considered a member of the genus *Neoleanira*

Pettibone, 1970, having three antennae and neuropodial compound spiniger chaetae while *Sigalion* has two antennae and a different suite of neurochaetae.

### CONCLUSIONS

The species *Sigalion mathildae* Audouin & Edwards in Cuvier, 1830, and *Sigalion squamosum* Delle Chiaje, 1830, are the only currently recognized species of the genus *Sigalion* Audouin & Edwards in Cuvier, 1830, to be found in north-west European waters.

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