

## THE IDENTITY OF THE ASCIDIANS *STYELA MAMMICULATA* CARLISLE AND *S. CLAVA* HERDMAN

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(Text-fig. 1)

Carlisle (1954) described *Styela mammiculata*, a new species of stalked ascidian from the Plymouth area, and suggested that it had been brought into British waters, probably with oysters. Its recent discovery on other parts of the south coast of England (Houghton & Millar, 1960) supports the idea that it is an introduced species which is now spreading through a favourable environ-

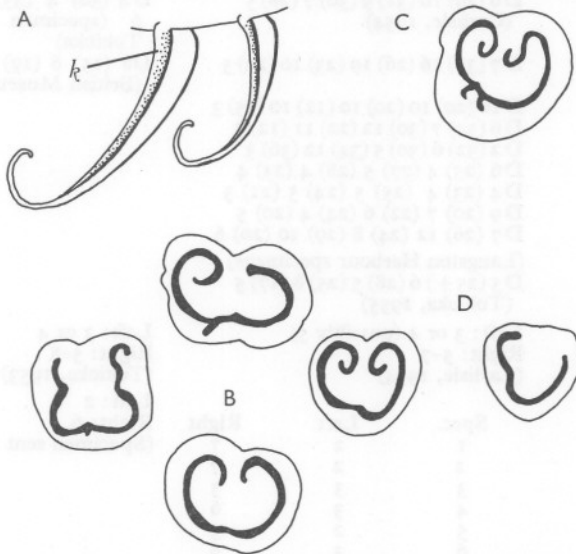


Fig. 1. A, oral tentacles of a specimen from Langston Harbour, to show keel (*k*). B, dorsal tubercles of specimens from Langston Harbour. C, dorsal tubercle of specimen of *S. clava* sent by Dr Tokioka. D, dorsal tubercle of specimen of *S. clava* from the British Museum.

ment. It is well, therefore, to consider whether this may not be a species known from another part of the world. Tokioka (1955) examined one of Carlisle's specimens and suggested that it fell within the range of variation of *S. clava* Herdman. As many specimens of *S. mammiculata* are now available, a more extensive comparison has been made and is reported in this paper.

I wish to thank Mr D. R. Houghton for specimens of *S. mammiculata* from Langston Harbour, Hants., Dr T. Tokioka for specimens of *S. clava* and for a translation of his Japanese paper (1955), and the British Museum (Natural History) for the loan of a specimen of *S. clava*.

Herdman's (1882) account of *S. clava* is not very detailed, but has been confirmed and amplified from the only one of Herdman's named specimens in the British Museum which was available for dissection.

TABLE 1. COMPARISON OF *STYELA MAMMICULATA* AND *S. CLAVA*

	<i>S. mammiculata</i>	<i>S. clava</i>
No. of oral tentacles	'About 40' (Carlisle, 1954) 40, 45, 47, 48, 48, 50, 65, 68 (Langston Harbour specimens) 33 (Tokioka, 1955)	'About 30' (Herdman, 1882) 'More than 45' (Tokioka, 1953) About 70 (specimen sent by Dr Tokioka) About 35 (British Museum specimen)
Branchial bars on right side	D 7 (30) 12 (36) 9 (32) 8 (30) 6 D 6 (29) 10 (31) 9 (30) 7 (28) 5 (Carlisle, 1954) D 7 (30) 16 (26) 19 (23) 10 (20) 5 D 10 (20) 10 (20) 10 (12) 10 (15) 3 D 6 (34) 7 (30) 12 (22) 11 (12) 5 D 2 (32) 6 (30) 5 (34) 12 (36) 3 D 6 (25) 4 (27) 5 (28) 4 (23) 4 D 4 (23) 4 (25) 5 (24) 5 (21) 3 D 9 (20) 7 (22) 6 (24) 4 (20) 5 D 7 (26) 12 (24) 8 (29) 10 (20) 6 (Langston Harbour specimens) D 5 (25+) 6 (28) 5 (25) 8 (17) 5 (Tokioka, 1955)	D 1 (39) 4 (37) 5 (40) 5 (34) 3 (Tokioka, 1953) D 4 (36) 4 (35) 5 (42) 5 (20) 6 (specimen sent by Dr Tokioka) D 8 (15) 6 (19) 7 (22) 7 (10) 3 (British Museum specimen)
No. of gonads	Left: 3 or 4 (possibly 5) Right: 5-7 (Carlisle, 1954)	Left: 3 or 4 Right: 5-8 (Tokioka, 1953) Left: 2 Right: 6 (Specimen sent by Dr Tokioka)
	Spec.      Left      Right	
	1            2            7	
	2            2            7	
	3            3            5	
	4            3            6	
	5            2            5	
	6            3            6	
	7            2            6	
	(Langston Harbour specimens)	Gonads not developed in British Museum specimen

*S. mammiculata* and *S. clava* cannot be distinguished by external form (Carlisle, 1954, fig. 1; Herdman, 1882, pl. XIX, fig. 9; Tokioka, 1953, pl. LXIV, fig. 6). I find that the oral tentacles of *S. mammiculata*, described by Carlisle as winged, not distinctly keeled, and all of one order of size, are in fact essentially similar in structure, number and arrangement to those of *S. clava* (Fig. 1, A, Table 1). The dorsal tubercle (Fig. 1, B, C, D; Carlisle,

1954, fig. 2E; Tokioka, 1953, pl. LXIV, fig. 9), the arrangement of branchial bars (Table 1), the number, structure and arrangement of the gonads (Table 1) and the form of the gut also fail to separate the species. In the absence of any other distinguishing features I conclude that *S. mammiculata* is a synonym of *S. clava*.

Hitherto *S. clava* has been known only from Japanese waters, the Sea of Okhotsk, and the coasts of Korea and Siberia. Within that area there are places with an annual fluctuation of sea temperature similar to that on the south coast of England. A species surviving accidental transport from the north-west Pacific to the English Channel might spread rapidly under favourable local conditions. This seems to have happened to *S. clava*, the first Japanese ascidian species known to have become established in British waters.

#### SUMMARY

A comparison of *Styela mammiculata* Carlisle with *S. clava* Herdman shows that they are synonymous. The name *S. clava* has priority.

#### REFERENCES

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