

Table S2. Fossil stylasterid species and paleontological information.

Stage/epoch	Age (mya)	Locality	Paleodepth	Species	Source for taxonomy and paleo-environment
Deep-water records (offshore)					
Paleocene (early)	~65	Fakse, Denmark	100-300m	<i>Astya crassa</i> ^a <i>Conopora arborescens</i> ^a <i>Errina irregularis</i> <i>Errina lobata</i> <i>Sporadopora faxensis</i> ^b <i>Pliobothrus dispergens</i> ^a <i>Pliobothrus laevis</i> ^a <i>Congregopora nasiformis</i> ^a	[1-5]
Eocene (late early)	~50	Seymour Island, Antarctica	100m ^c	<i>Conopora mariae</i>	[6]
Eocene (late)	38-42	Eua, Tonga	>200m	<i>Astya nielseni</i> <i>Stylaster sp.</i> ^d <i>Crypthelia boschmai</i> <i>Crypthelia vetusta</i>	[1,7]
Miocene (early)	~24.5	Pakaurangi Point, New Zealand Pakaurangi Point, New Zealand Pakaurangi Point, New Zealand	up to 100m at Waiteroa up to 250m at Pakaurangi up to 300m ^e up to 300m ^e	<i>Calyptopora sp. cf. reticulata</i> <i>Conopora cf. laevis</i> <i>Inferiolabiata cf. labiata</i>	[8,9]
Miocene (lower Messinian)	~6.5	Carboneras, Spain	Upper bathyal	<i>Calyptopora sp.</i> <i>Conopora sp. 1</i> <i>Conopora sp. 2</i> <i>Conopora sp. 3</i> <i>Crypthelia sp. 1</i> <i>Crypthelia sp. 2</i> <i>Distichopora sp.</i> <i>Lepidopora sp.</i> <i>Pliobothrus sp. 1</i> <i>Pliobothrus sp. 2</i> <i>Stenohelia sp.</i> <i>Stylaster sp. 1</i> <i>Stylaster sp. 2</i> <i>Stylaster sp. 3</i>	[10]
Shallow-water records (onshore)					
Oligocene (lower)	32.8-38	Washington state, U.S.A.	shallow-water	<i>Stylaster milleri</i>	[11,12]
Pliocene (early)	5.1	Rauhine Range, New Zealand	10-30m ^f	<i>Sporadopora ?mortenseni</i>	[8]
Pliocene (early)	3.3-5.1	Kaawa Beach, New Zealand	~5m ^f	<i>Stylaster gigas</i>	[8]
Pliocene (early)	5.1	Grange Burn, Australia	shallow-water	<i>Sporadopora dichotoma</i>	[13]
Pliocene (Late)	2.0-3.3	Pitt Island, New Zealand	inner shelf	<i>Sporadopora marginata</i>	[8,14]
Pliocene (Late)	2.0-3.3	Wanganui, New Zealand	~10-40m	<i>Sporadopora sp.</i>	[8,15,16]
Pliocene	3.4	Costa Rica and Panama	37-73m ^g	<i>Stylaster roseus</i>	[17]

Table S2. (continued)

Stage/epoch	Locality	Paleodepth	Species	Source for taxonomy and paleo-environment
Paleodepth undetermined				
Eocene (Lutetien)	Paris Basin, France	shallow-water? ^h	<i>Distichopora antiqua</i>	[3]
Eocene (early-mid)	Kakanui, New Zealand	shallow or deep ⁱ	<i>Errina sp.</i>	[8]
Eocene	Madagascar		<i>Stylaster sp.</i>	[12]
Oligocene	Sasselo, North Italy		<i>Stylaster antiquus</i>	[3,12]
Oligocene	Lattorf, Central Germany		<i>Stylaster compressus</i>	[3,18]
Miocene (early)	Kakanui, New Zealand	Near wavebase?	<i>Lepidopora sp.</i>	[7,16]
Miocene	South of Iwaihara, Japan		<i>Stylaster chibaensis</i>	[19]
Miocene	Moravia, Czech Republic		<i>Stylaster priscus</i>	[3,12]
Miocene (middle)	Muddy Creek, Australia		<i>Distichopora sp.</i>	[13]
Miocene (middle)	Victoria, Australia		<i>Stylaster moorabolensis</i>	[13,18,20]
Pleistocene-Recent	Sicily, Italy		<i>Stenohelia ?maderensis</i>	[3]
Pleistocene-Recent	Calabria and Sicily, Italy		<i>Errina aspera</i>	[3]
Plio-Pleistocene	Southern Italy		? <i>Distichopora sp.</i> ^j	[3]

Abbreviations used are ‘mya’ (millions of years before present) and ‘m’ (meters);

^a Also known from lower Paleocene of Northern Germany [21];

^b Also known from lower Paleocene (middle and upper Danian, 60.2-63 mya, in paleodepths of 60-80 m) from Paris Basin, France [22];

^c According to Stolarski [6], some of the formation may have been deposited in shallower waters due to the phenomenon of emergence of deep-sea taxa in high latitudes;

^d Gastrostyles not observed [7], thus it is possible that *Stylaster sp.* is in fact a *Conopora*;

^e Paleodepth for most of formation, some thinner units of nearshore and estuarine formation (J. A. Grant-Mackie, personal communication);

^f Paleodepth estimated by J. A. Grant-Mackie (personal communication);

^g ‘Restricted’ depth range, sensu Cairns [17];

^h ‘probably infralittoral’ [10]; precise paleodepth not determined. The specimen deposited at the Muséum national d’Histoire naturelle, in Paris, France, was observed by Zibrowius and Cairns [3], who confirm the identification as *Distichopora*;

ⁱ The presence of several invertebrates indicates deposition in shallow-water, whereas the presence of beds without the foraminifer *Asterocyclina speighti* also suggest deposition in deep waters [14]. The absence of zooxanthellate corals further indicates deep-water deposition (J. A. Grant-Mackie, personal communication);

^j Specimens not located and possibly based on bryozoans [3].

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