

Supplementary Material 3. Literature for fossil calibrations and geographic ranges, and characteristics of shell morphology in stromboid families (table), used to identify fossils to family level to aid finding the earliest representatives of each group. A complete reference list is given below the table, with those used for extant geographic ranges of stromboids (not included in the main text) added.

	Aporrhaidae	Xenophoridae	Struthiolariidae	Rostellariidae	Seraphsidae	Strombidae
Overall shape	Fusiform	Low, depressed to conical, trochiform	Fusiform, inflated, ovate	Slender, fusiform	Long, torpedo-shaped, fusiform	Fusiform
Protoconch shape	Dome-shaped, four convex whorls	Rounded or median angular; 3 to 4 whorls, depressed to conical	Rounded whorls	3 to over 6 rounded whorls, conical	Flattened, relatively large	3 to 4.5, rounded whorls; conical
Teleoconch shape	Tall, conical spire with apical angle of ca. 35-40°	Broad base (flattened or concave). Narrow to wide, simple to spinose peripheral flange	Angular spire; large, stout, rounded lower whorls	High spire and ovoid body whorl	Body whorl covers majority or all of the higher whorls	Diverse shapes
Protoconch sculpture	Smooth	Smooth or with spiral ribs	Smooth	Smooth	Smooth	Growth lines, and may be smooth or ornamented
Teleoconch sculpture	Heavily sculptured spire and body whorl, with axial and/or spiral ridges	Typically lacks sculpture (except growth lines and a spiral cord). Diverse objects (e.g. shells, coral rubble, pebbles) agglutinated to surface	Nodulose spire; smooth lower whorls (except axial growth lines). Columella broad, callused	Variable; smooth to ornamented by axial ribs and variable varices	Smooth and lacking sculpture (few exceptions)	Spire and body whorl often heavily sculptured with ridges and knobs, but can be almost smooth. Thick columellar callus, often with teeth or lirae
Aperture	Elongate, with long siphonal canal	Large, strongly oblique, with thin margins. Siphonal canal absent.	Large, oval, thickened margin. Short siphonal canal	Elongated or elliptical. Anterior siphonal canal is typically long (shorter in	Slightly flaring or thin. Shell forms a wide siphonal groove	Narrow, with short siphonal canal

				Rimellinae), continuing in a narrow posterior groove		
Outer lip	Thickened and expanded outer lip. Three or more projecting digits –variety of spines, hooks, knobs, and fan-like shapes with internal grooves	No terminate growth (outer lip not thickened)	Thickened outer lip	Elongate and pointed with ‘stromboid notch’ (Rimellinae), or thickened, convex outer lip. Often with ridges or wrinkles, and a variable number of finger-like projections.	Basal margin of the body whorl does not extend to the level of the columella base, or continues in a curved callus groove to the apex	Thickened and expanded outer lip. Shallow to well-defined ‘stromboid notch’ at anterior end. Other diverse sculpture present on outer lip
References	Popenoe, 1983; Bandel 1993; Bandel et al., 1997; Kiel and Bandel, 1999; Simone, 2005; Gründel et al., 2009	Morton, 1958; Ponder 1983; Bandel, 1993; Wells, 1998; Kreipl and Alf, 1999; Simone, 2005; Bandel, 2007	Wells, 1998; Bandel, 2007	Kronenberg and Berkhout, 1984; Wells, 1998; Bandel, 2007	Wells, 1998; Jung, 1974; Kronenberg and Berkhout, 1984; Simone, 2005; Bandel, 2007	Walls, 1980; Popenoe, 1983; Savazzi, 1991; Simone, 2005; Bandel, 2007

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