

# REEF SHELF

## Coral Finder 2022

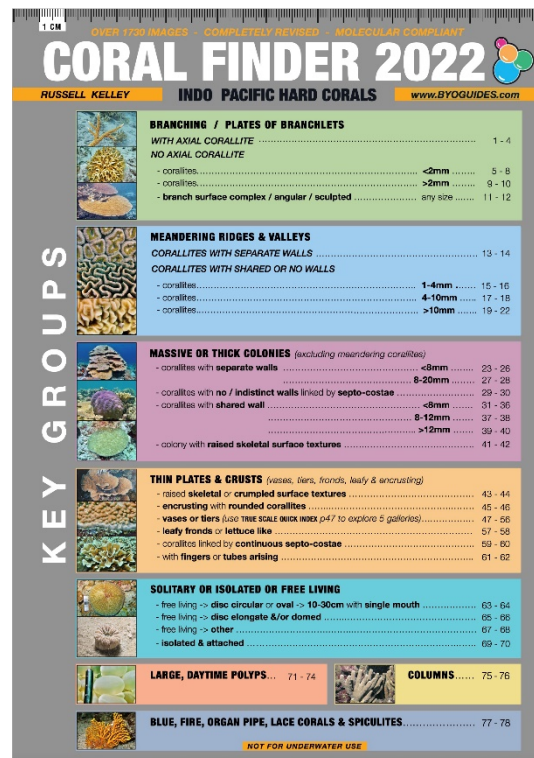
Russell Kelley

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US\$ 57.14

(not for underwater use)



Coral Finder 2022 (CF2022) is the updated 5<sup>th</sup> edition of the popular *CoralFinder* guide book, which teaches users how to identify Scleractinian corals to genus level using a range of clearly-defined characters. Identification of corals is notoriously difficult due to a range of factors including their morphological plasticity, and more recently because molecular phylogenetics is changing our understanding of systematic relationships. What makes CF2022 such an excellent resource is that it teaches a process that allows the user to make informed and consistent decisions when identifying corals, with reference to the latest scientific research, but which remains robust to inevitable future changes to coral taxonomy.

Over the last 25 years, the 'molecular revolution' has fundamentally altered our understanding of the systematic relationships and evolutionary history of corals and many other branches of the tree of life. While these powerful new tools have provided fascinating insights into coral evolution, they have also shown that many of the characters traditionally used to delineate species, genera and families are not informative. Moreover, most coral families described in *Corals of the World* in 2000 have now been shown to be polyphyletic; for example, the 15 species of *Montastraea* split among 6 genera in three families. While these

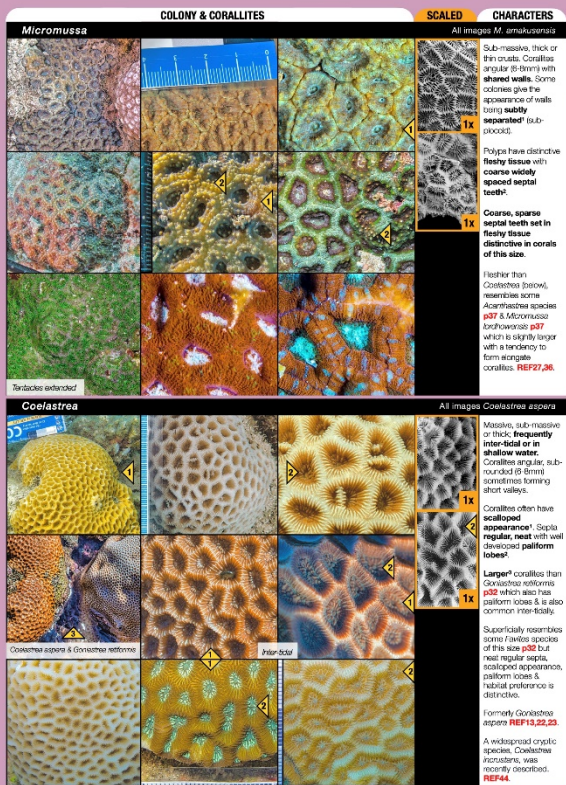
sorts of results excite coral taxonomists, they have a tendency to illicit a very different reaction in those trying to identify corals in the field. CF2022 does an admirable job of bridging this deep and treacherous divide by using clearly-defined, quantitative characters for field identification of corals to genus level, while also providing information needed for the user to go further if they so desire. Consequently, it is both an excellent tool for the field scientist and the perfect introduction for those beginning their journey in the fascinating but sometimes daunting world of coral identification.

The real advantage of the *CoralFinder* series, including CF2022, is that it teaches a process rather than spreading a gospel. The start of the book defines and illustrates all of the characters used to delineate coral genera: what shape are the colonies and the corallites? How do you measure the corallites consistently when they often vary in size within a colony? These characters are then clearly illustrated using over 1700 images of corals in the field which, like previous CF editions, are arranged by genera with similar characters to clearly illustrate their differences. Learning these characters is critical for two reasons: firstly, it allows the user to make robust, repeatable decisions about the names they are applying to corals. While species and



**Comments:** by definition axial corallites lead new branches with secondary axial corallites emerging on branch sides. Evolutionary variation in the size, number & density of axial / radial corallites accounts for the astonishing variety of growth forms in *Acropora*. 2

An example page illustrating the key characters of the genus *Acropora*.






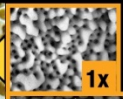
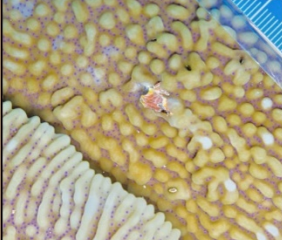





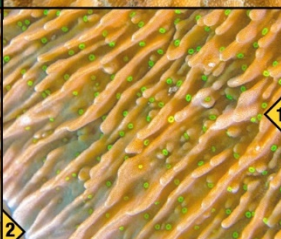

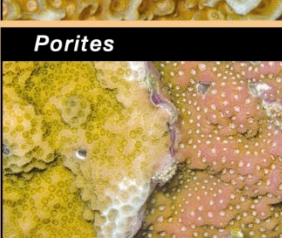
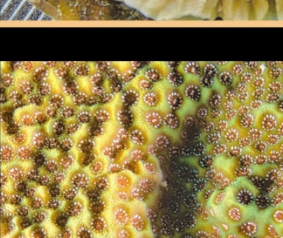
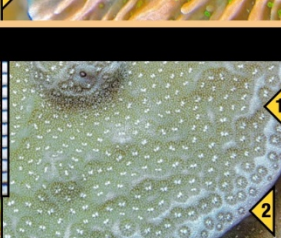




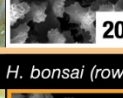
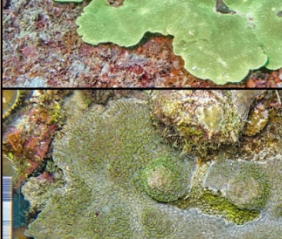
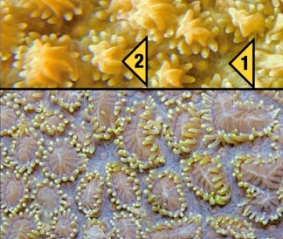

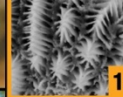





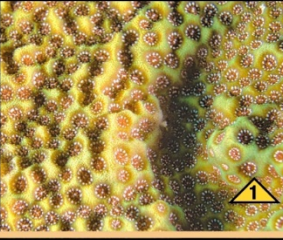

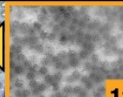








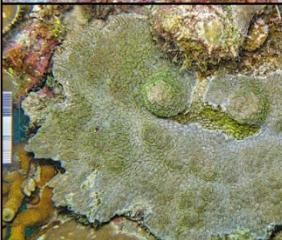



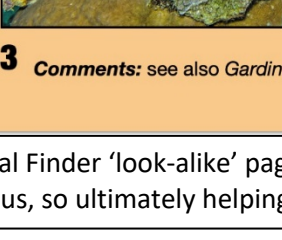
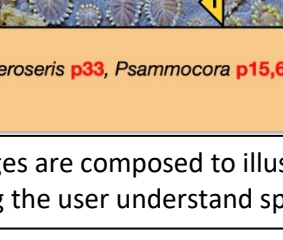
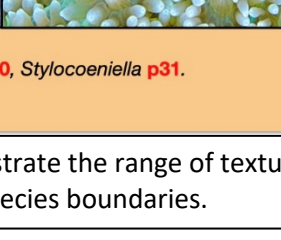





35 **Comments:**

Coral Finder 'look-alike' collages allow the user to compare and contrast genera matching the description at the top of the page. The 'SCALED' column (reproduced at true scale in print) is a crucial reality check for the user.

potentially even generic and family names will continue to change as new information comes to light, applying a consistent framework provides the best chance that data collected will be robust to future changes. In science we are always obtaining new information which can alter understanding of a subject. We can't always be right, but we can make our science repeatable, and CF2022 applies this axiom to the sometimes dark art of coral identification. The other key point is that even if the taxonomy does change, understanding the characters presented in CF2022 will allow users to rapidly update their knowledge to capture this new understanding. For those wishing to take this next step, CF2022 contains an excellent bibliography showing the research papers that describe all the gory details of how and why these taxonomic changes were made. In short, it provides all the basic tools, while also illuminating a path forward for those with masochistic tendencies.

Finally, one of Russell's great insights is to draw on 'the powerful human-eye brain supercomputer'. We are capable of processing multidimensional information in a way that is impossible to capture in a matrix of morphological characters. When we observe corals in the field, our brains are taking in much more information than we may realise, providing us with a capacity to differentiate things even when it is difficult for us to describe exactly how they differ. We can easily recognize different people by their facial features, even if we struggle to explain exactly what features we recognize. The same logic can be applied to corals – our human eye-brain supercomputer will often be able to differentiate corals by their 'giss' or 'jizz' (to use a birding term), and in many cases these empirical observations are subsequently confirmed by quantitative molecular analyses. Consequently, I strongly endorse Russell's call to engage that supercomputer when observing corals in the field. When it comes to identifying corals, there is no substitute for time spent in the field. So, grab a camera, a copy of CoralFinder 2022, and get out in the water!

**Tom Bridge** (Senior Scientist and Curator, Coral Ecology and Evolution Program, Queensland Museum Network, and James Cook University, Townsville)

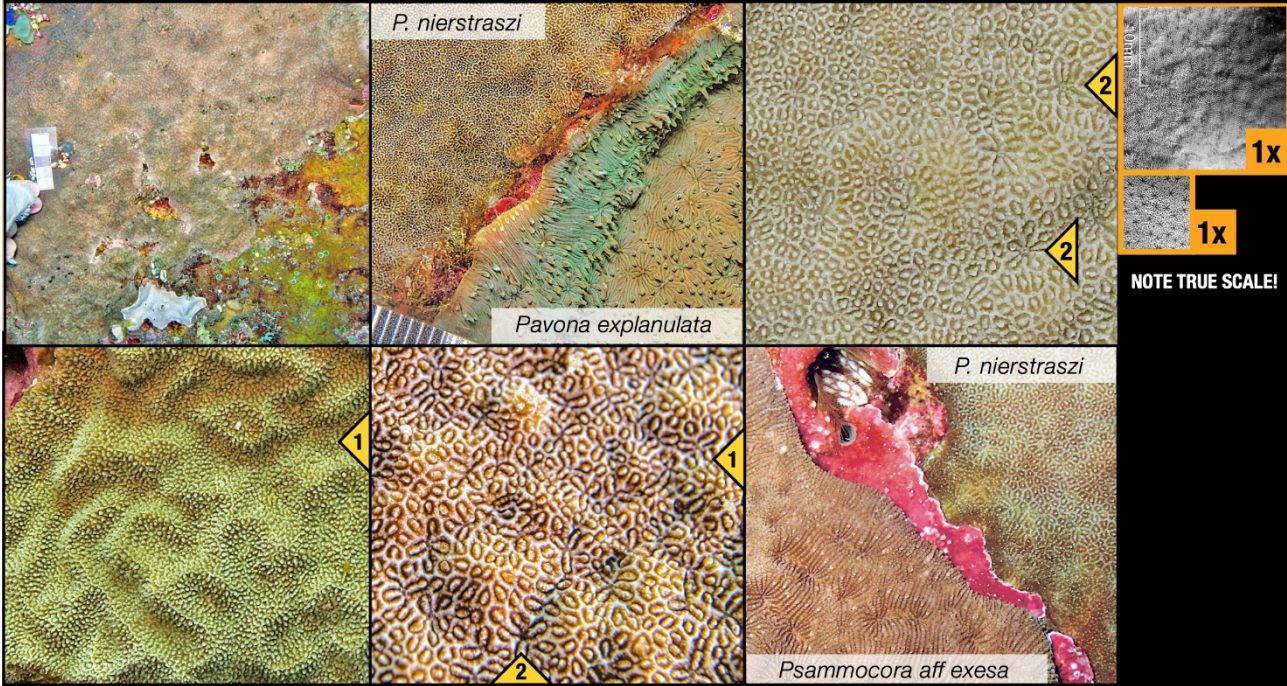
COLONY & CORALLITES			SCALED	CHARACTERS	
<b>Montipora</b>					
<i>All images Montipora sp.</i>					
				<p>Thin crusts, sheets, occasionally thicker. Corallites <b>very small (0.5-1mm)</b>, poorly defined, often immersed<sup>1</sup> among complex skeletal structures on colony surface.</p> <p>Underwater the distinctive skeletal surface textures make thin plate <i>Montipora</i> generally easy to recognise. But a small number of plate forming <i>Porites</i> species (below) may cause confusion. In general <i>Montipora</i> corallites are <b>slightly smaller &amp; less well defined especially at the edges<sup>2</sup></b> of the colony.</p> <p>Note: <i>Porites rus</i> &amp; <i>P. monticulosa</i> may cause confusion with platey <i>Montipora</i> species but collecting &amp; bleaching a small skeletal sample will reveal the <b>unique septal character</b> of each genus, i.e. simple <b>septal spines<sup>3</sup></b> for <i>Montipora</i> &amp; a <b>complex arrangement of pillars</b> for <i>Porites</i> (below).</p>	
					
					
					
					
					
					
<b>Porites</b>					
<i>All images Porites sp.</i>					
				<p>Crusts or sheets which may flank central upgrowths. Corallites (0.8-1.5mm) <b>set among surface ridges</b> are <b>slightly larger, better defined<sup>1</sup></b> than <i>Montipora</i> (above) - <b>especially at colony edge<sup>2</sup></b>. See discussion above.</p>	
					
<b>Hydnophora</b>					
<i>H. bonsai</i> (row 1); <i>H. exesa</i> (row 2)					
				<p>Crusts, sheets, sometimes with upgrowths. Corallites <b>obscure (2-3mm)<sup>1</sup></b> lying immersed between raised segments of skeleton called <b>monticules<sup>2</sup></b>.</p> <p>Monticules (a.k.a. hydnohores - see glossary) may be conical bumps or fuse to form <b>short ridges<sup>3</sup></b>.</p> <p>Monticules &amp; corallite centres may be completely obscured by daytime extended tentacles.</p>	
					
					
					

**43** **Comments:** see also *Gardineroseris* p33, *Psammocora* p15,60, *Stylocoeniella* p31.

Coral Finder 'look-alike' pages are composed to illustrate the range of textures to be found within a coral genus, so ultimately helping the user understand species boundaries.

**Psammocora - 2 species groups**

*Psammocora nierstraszi* (rows 1 & 2) except as noted ;



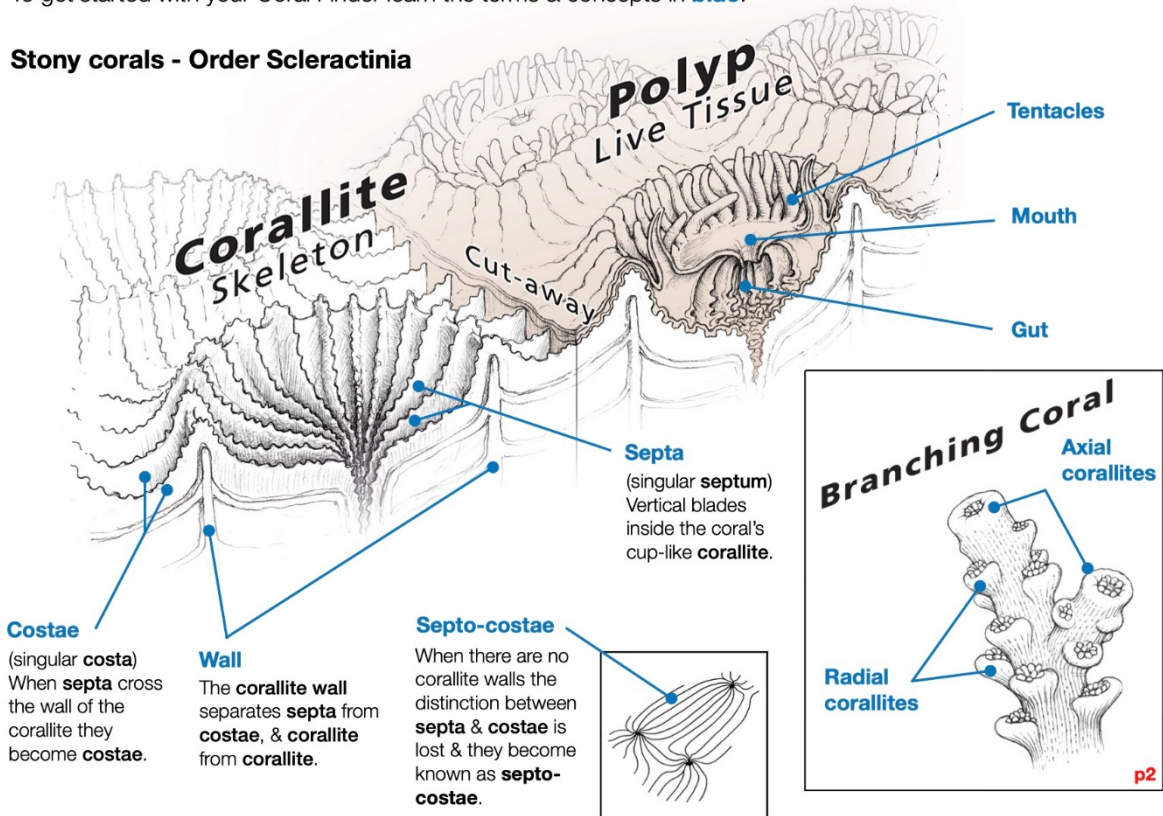
Detail from another 'look-alike' page. The 'two-shot' comparisons can be helpful in illustrating detail.

**GLOSSARY**

Watch the INTRO videos: [www.byoguides.com](http://www.byoguides.com)

To get started with your Coral Finder learn the terms & concepts in **blue**.

**Stony corals - Order Scleractinia**



The 'Visual Glossary' illustrates a simplified subset of taxonomic terms, assisting the user to progress fairly quickly using the Coral Finder's visual search system.