POCKET GUIDE

Fungi of Randwick

Dr. Anna Voytsekhovich

Randwick City Council
a sense of community

Volvopluteus gloiocephalus

Boletus sp.

Coprinopsis lagopus

Coprinus comatus

ACKNOWLEDGEMENT OF COUNTRY

The Bidjigal and Gadigal Peoples are the original custodians of the lands now known as Randwick City.

We acknowledge and pay our respects to their Elders past and present, and extend this to all Aboriginal and Torres Strait Islander People reflecting the ongoing contributions of these communities to lands, sea, sky and culture.

This pocket guide was a collaboration between local mycologist Dr. Anna Voytsekhovich and Randwick City Council.

INTRODUCTION

This pocket guide includes morphological and ecological data on 86 species of common and interesting fungi growing on the territory of Randwick City. The guide is organised by the main morphological groups of fungi. However, some fungi with similar shape and colour are not closely related.

The main body of a fungus is often not visible without magnification. It consists of long filamentous threads known as hyphae. Groups of hyphae make up mycelium. The part we recognise as the mushroom is the reproductive structure or fruiting body. Fungal fruit bodies are extremely diverse in form, colour and texture. There are some easily recognisable fungi, but also plenty of 'look-alikes' and species that are extremely difficult to identify without microscopy or molecular testing. Some Australian species haven't even been described yet.

HEALTH WARNING - POISONOUS FUNGI

This pocket guide is for general identification and education only. **People should not pick or eat wild fungi.** There are many poisonous species and native look-a-likes. Cooking, soaking, peeling, or drying poisonous mushrooms does not make them safe to eat.

Agaricus cf xanthodermus

Amanita vaginata complex

Cortinarius cf sublilacinus

Entoloma virescens complex

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ABOUT THE AUTHOR

Dr Anna Voytsekhovich

Anna holds a Bachelor's degree in Biology and Ecology, and a PhD in Botany. She is a professional scientist with more than 15 years of experience in academic research in the field of Botanical sciences and Cryptogams diversity. She is an author and co-author of more than 40 scientific publications and has described a few species new to science. In her current role as a bush regenerator, Anna works on the restoration of critically endangered plant communities of the Eastern Suburbs of Sydney.

Anna is also known as a professional scientific illustrator, botanical artist and wildlife illustrator. She is a member of the Botanical Art Society of Australia and Florilegium Society. She teaches botanical and wildlife art for the Royal Botanic Garden Sydney and NatureArt Lab in Canberra combining art and science in her tuition.

'Medicinal fungi' Artwork by the author. →

GLOSSARY

Amoeba *A single-celled animal that catches food and moves about by extending finger-like projections of protoplasm. Amoebas are either free-living in damp environments or parasitic.*

Ascomycetes *Represent a phylum within the kingdom of Fungi, which are non-mobile, cellular organisms. They represent the group of fungi with the largest number of species currently known. Commonly known as sac fungi, cup fungi, earth tongues, cramp balls, dung buttons, truffles, or moulds.*

Ectomycorrhizal *A type of symbiotic mycorrhizal association of fungi with the feeder roots of higher plants in which both the partners are mutually benefitted. Ectomycorrhizae are fungi that are only externally associated with the plant root as opposed to within the cells of the host (Endomycorrhizae).*

Eukaryotic *Organisms whose cells contain membrane-bound structures. This includes protozoa, fungi, plants, and animals.*

Fruiting Body *Fungal structures that contain spores. Also known as a sporocarp. Part of the sexual phase of a fungal life cycle.*

Fungi *Any of a group of spore-producing organisms feeding on organic matter, including moulds, yeast, mushrooms, and toadstools.*

Globose *Having the form of a globe; globelike; spherical.*

Hymenophore *The part of a fungus fruiting body which produces spore-bearing cells. The most common types include lamellae (gills), pores and teeth.*

Hyphae *Each of the branching filaments that make up the mycelium of a fungus.*

Lamellae *Any of the spore-bearing gills of a mushroom. They are used as a means of spore dispersal and are important for species identification.*

Morphological *Relating to the form or structure of things.*

Mycelium *A root-like structure of a fungus consisting of a mass of branching.*

Mycorrhiza *"Myco" – "rhiza" literally means "fungus" – "root" and describes the mutually beneficial relationship between a plant and root fungus. These specialised fungi colonise plant roots and extend far into the soil allowing for more effective nutrient and water uptake by the plant.*

Plasmodial *A multinucleate, often large mass of protoplasm that moves and ingests food and is characteristic of the vegetative phase of plasmodial slime moulds.*

Polymers *Materials made of long, repeating chains of molecules.*

Saprotrophic *Refers to organisms that feed on non-living organic matter known as detritus at a microscopic level. These organisms are considered critical to decomposition and nutrient cycling and include fungi, certain bacteria, and water moulds.*

Spores *Reproductive units or cells that germinate or develop into new individuals without fusion with other reproductive cells. Spores are agents of asexual reproduction and are produced by bacteria, fungi, algae, and plants.*

Stipe *A usually short stalk of a plant or fungus that supports the top of the structure.*

Symbiotic *A relationship between two dissimilar organisms. The specific kind of symbiotic relationship depends on whether either or both organisms benefit from the relationship. There are four main symbiotic relationships: mutualism, commensalism, parasitism, and competition.*

SYMBOLS AND ABBREVIATIONS USED

SYMBOLS

Mycorrhizal (beneficial to plants - see 'Mycorrhiza' definition above)

Saprotrophic (recyclers - see definition above)

Approx. size of fungi

GROWING MEDIUM/SUBSTRATE

BOLETES

Most species produce large fleshy mushroom-shaped fruit bodies with a more or less central stipe. Usually have pores (tubular hymenophore) instead of gills (lamellae). Many boletes change colour when bruised.

The majority of Boletaceae family are symbiotic and form mutually beneficial mycorrhizal associations with various plants.

A number of rare or threatened species are also present in the family, that have become the focus of increasing conservation concerns. As a whole, the typical members of the family are commonly known as boletes.

Australopilus cf. palumanus

SOIL LEAF LITTER

Gyroporus mcnabbii

SOIL LEAF LITTER

Tylopilus balloui group

SOIL LEAF LITTER

Tylopilus sp.

SOIL LEAF LITTER

AGARICS

Have a cap with gills. A stem may be present or absent. Most agarics are mushroom shaped. Agarics without stems are often referred to as ‘fans’. The members of this group play a key role in the global carbon cycle. They developed complex enzymes that help them to decompose all plant polymers, including lignin.

Amanita farinacea - Australian Flour Lepidella

SOIL LEAF LITTER

Agaricus cf. xanthodermus - Yellow Stainer

SOIL LEAF LITTER

Amanita grisella complex

SOIL LEAF LITTER

Amanita vaginata complex

SOIL LEAF LITTER

Chlorophyllum molybdites - False Parasol or Green-Spored Parasol

SOIL LEAF LITTER

Coprinus comatus - Shaggy mane

SOIL LEAF LITTER

Cortinarius phalarus

SOIL LEAF LITTER

Cruentomycena viscidocruenta - The ruby bonnet

LEAF LITTER MULCH WOOD

Descolea recedens

SOIL LEAF LITTER

Coprinellus disseminatus - Fairy inkcap

SOIL LEAF LITTER MULCH

Cortinarius rotundisporus - Elegant blue webcap

SOIL LEAF LITTER

Entoloma virescens - Skyblue pinkgill

SOIL LEAF LITTER

Gymnopilus junonius - Spectacular rustgill

MULCH WOOD

Coprinellus micaceus - Mica cap

SOIL LEAF LITTER MULCH

Cortinarius cf. sublilacinus

SOIL

Hygrocybe miniata - The vermilion waxcap

SOIL LEAF LITTER

Lepiota hemorrhagica

SOIL LEAF LITTER

Laccaria canaliculata

SOIL LEAF LITTER

Lepista sublilacina - Lilac blewit

SOIL LEAF LITTER

Leratiomyces ceres - Redlead roundhead

LEAF LITTER MULCH

Leucocoprinus birnbaumii - Flowerpot parasol

SOIL LEAF LITTER MULCH

Omphalotus nidiformis - Ghost fungus

MULCH WOOD

Mycena carmeliana

WOOD

Parasola plicatilis - Pleated inkcap

SOIL LEAF LITTER MULCH

Pluteus lutescens

WOOD

Resupinatus cinerascens

WOOD

Rickenella fibula - Orange mosscap

SOIL

Russula neerimea

SOIL LEAF LITTER

Tricholomopsis decora - Decorated mop

WOOD

LEATHERS & POLYPORES

Have hard and woody or leathery textures and pores on their under surface. Also known as bracket fungi or shelf fungi.

Amauroderma rude
- Red-staining stalked polypore

MULCH WOOD

Daldinia concentrica - King Alfred's cake

WOOD

Hexagonia tenuis

WOOD

Lentinus arcularius - Spring polypore

MULCH WOOD

Laetiporus portentosus - White punk

WOOD

Microporus sp.

WOOD

Panellus pusillus (underside)
- Little ping-pong bat

WOOD

Phellinus sp.

WOOD

Schizophyllum commune (top side)

Schizophyllum commune (under side)

Schizophyllum commune - Common split gill

WOOD

Stereum illudens - Wax fungus

WOOD

Trametes coccinea - Southern cinnabar polypore

WOOD

Trametes versicolor - Turkey tail

WOOD

Phellinus sp.growing on wood

PUFFBALLS

Generally globose in form. Earthstars have star-shaped rays. Some are stalked. All have dry powdery spores that are formed inside a sac-like structure.

Geastrum clelandii

SOIL MULCH

Geastrum fornicatum - The arched earthstar

SOIL MULCH

Geastrum tenuipes - Beaked earthstar

MULCH

Geastrum triplex - The collared earthstar

SOIL MULCH

Geastrum saccatum - The rounded earthstar

SOIL MULCH

Lycoperdon cf. pratense - Meadow puffball

SOIL LEAF LITTER WOOD

Lycoperdon pyriforme - Pear-shaped puffball

SOIL LEAF LITTER MULCH

Myriostoma australiensis - Australian pepper pot

SOIL LEAF LITTER MULCH

Scleroderma cepa (opened)

SOIL LEAF LITTER MULCH

Sphaerobolus stellatus - Cannonball fungus

WOOD

Pisolithus sp.

SOIL

JELLY FUNGI

Come in a diverse range of forms. All have a jelly-like consistency. Spores are produced over the entire surface. When dried, jelly fungi become hard and shrivelled; when exposed to water, they return to their original form.

Auricularia aff fibrillifera - Wood ear

WOOD

Calocera cf. sinensis

WOOD

Dacryopinax spathularia - Fan-shaped jelly fungus

WOOD

Ductifera sucina

WOOD

Tremella globispora

WOOD

Tremella fusciformis

WOOD

Tremella mesenterica complex

CORAL & CLUB FUNGI

Can be a simple unbranched club shape or highly branched to resemble coral. Spores are produced over the entire outer surface of the fruit body.

Aphelaria complanata

SOIL

Clavulina cinerea

SOIL

Clavulinopsis amoena

SOIL

Geoglossum cf. cookeanum

SOIL

Ramariopsis crocea

SOIL

Trichoglossum hirsutum

SOIL

STINKHORNS

Share the common trait of forming spores in a slimy foul-smelling substance. All emerge from egg-like structures that are often buried under leaf litter or wood chips.

Lysurus mokusin - Lantern stinkhorn

LEAF LITTER MULCH

Aseroe rubra - Anemone stinkhorn

MULCH

Ileodictyon gracile - Smooth cage fungus

LEAF LITTER MULCH

Mutinus boninensis

LEAF LITTER MULCH

Phallus rubicundus

LEAF LITTER MULCH

Mutinus cartilagineus (dissected)

SOIL LEAF LITTER MULCH

CRUST FUNGI

Generally have crust-like fruiting bodies that are formed on the underside of dead tree trunks and branches. Some of them are ectomycorrhizal.

Annulohypoxylon bovei - Cramp balls

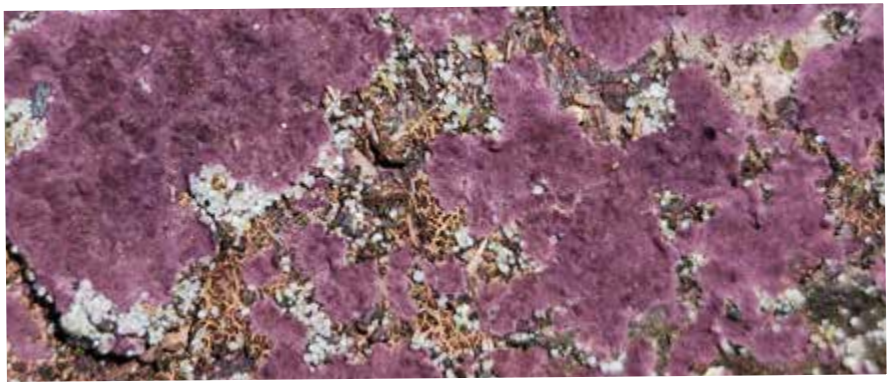
WOOD

Byssomerulius corium - Netted crust fungus

WOOD

Phlebiopsis crassa - Paint fungus

WOOD



Phlebopsis crassa

CUP FUNGI

Can be simple flat discs, obvious cups, stalked and cupped. Spores are produced on the smooth interior of the cup. This group consists mostly of Ascomycetes.

Aleurina ferruginea

SOIL

Aleurina argentina

SOIL

Chlorociboria aeruginascens - Green elfcup

WOOD

SLIME MOULDS

Formerly classified as fungi, today these organisms are referred to as Kingdom Protista. Although traditionally we call them slime moulds, in fact they represent different eukaryotic organisms that can live freely as single cells, but can aggregate together to form multicellular reproductive structures. They have a plasmodial (amoeba-like) stage in their life cycle and they respond to light.

When they are ready to form spores, the slime will switch from avoiding light to being attracted to it. But apart from that, wherever they go, they lay down a chemical trail which helps them in searching for food.

Ceratiomyxa fruticulosa - Coral slime

WOOD

Fuligo septica - Scrambled egg slime

WOOD

Lycogala epidendrum - Wolf's milk slime

WOOD

Nectria sp.

WOOD

Stemonitis sp. - Chocolate tube slime

WOOD

Stemonitis sp.

DID YOU KNOW?

Fungi are in a kingdom of their own but are closer to animals than plants.

According to the latest data (Hawksworth & Lücking, 2017) the actual range of fungi is properly estimated at 2.2 to 3.8 million species.

The largest living organism in the world is *Armillaria ostoyae*, aka Honey Fungus. It grows in North America in Oregon and measures 9 square kilometres! Scientists also believe that this particular fungus may be over 2,000 years old.

Some fungi have been used by Indigenous Australians for thousands of years! For instance, *Choiromyces aboriginum* - a truffle-like fungus found in the dry arid areas of SA, WA and NT is a traditional native food and a source of water. Many other fungi like *Trametes* spp., *Phellinus* sp., *Pisolithus* sp., *Podaxis pistillaris*, etc. were used as medicinal treatments.

A mould fungus *Aspergillus tubignensis* is capable of breaking down plastics in weeks.

At least 350 species of fungi are consumed as foods including truffles, which can sell for thousands of dollars apiece.

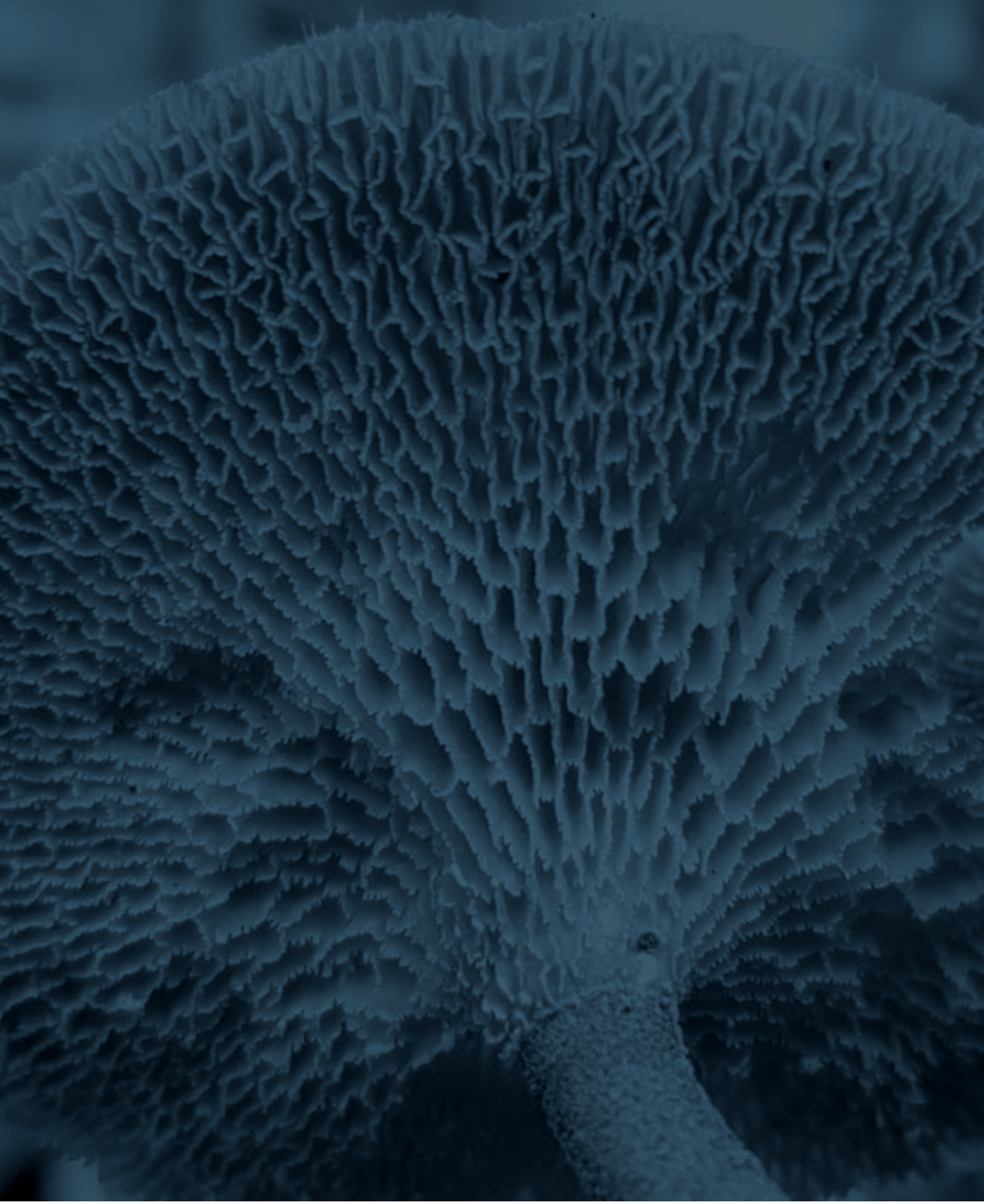
Plastic car parts, synthetic rubber and lego are made using itaconic acid derived from fungi.

Fungi are being used to turn crop waste into bioethanol.

Products made from fungi can be used as replacements for polystyrene foam, leather and building materials.

Nowadays, citric acid and bioactive enzymes in different laundry products and detergents are mass-produced by microscopic fungi.

Fungi are a potential goldmine for the production of pharmaceuticals including antibiotics and antioxidants, which can help us in the battle against antibiotic resistance.



Randwick City Council
a sense of community

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