

IT'S TIME TO TELL YOU ABOUT ONE OF THE BIGGEST LIVING ORGANISMS ON THIS PLANET

DO YOU RECOGNISE THE SPECIMEN HE'S PIGGING ON?

BIGGER THAN ALOYS LOLO WHO'S EATING THROUGH OUR HARVEST?

AN AMARILLARIA GALLICA!

RAW!

HE'LL GET A SORE STOMACH

# BENEATH US

DELTA (6)-PROTOILLUDENE SYNTHASE

IT'S PRECISELY THIS KIND OF ARMILLARIA I WANT TO TELL YOU ABOUT

ALOYS IS ACTUALLY NIBBLING ON THE MUSHROOM'S REPRODUCTIVE ORGAN!

IN FACT, THE BIGGEST PART OF THE MUSHROOM IS ITS MYCELIUM THAT GROWS IN THE SOIL

AND CAN SPREAD OVER HUNDREDS OF ACRES!

WEIGH HUNDREDS OF TONS

... & LIVE THOUSANDS OF YEARS!

WHICH SHOULD BE CALLED A SPOROPHORE OR A CARPOPHORE

CRAZY...!

NO?

HOW DOES OUR CHUBBY LITTLE FUNGUS DO THAT?

THANKS TO ITS RHIZOMORPHS, WHICH MAKE UP THE MYCELIUM. THEY'RE LIKE ROOTS THAT RUMMAGE, BURR OW AND DELVE

IN THE GROUND, FEEDING OFF DAMAGED TREE ROOTS AS THEY SECRETE SQUADS

OF CELL-WALL DEGRADING ENZYMES

TYPICAL RHIZOMORPH ATTACK

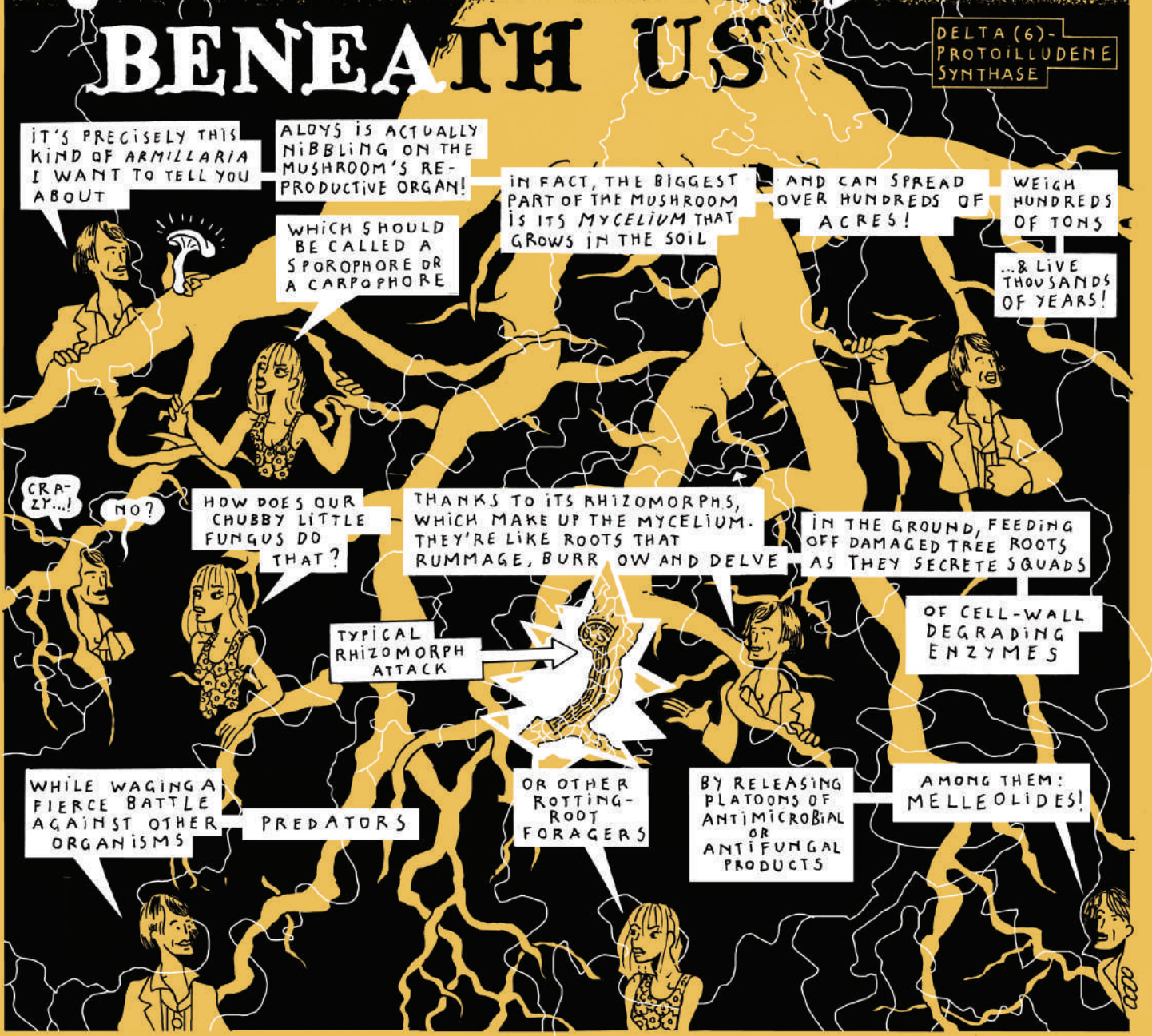
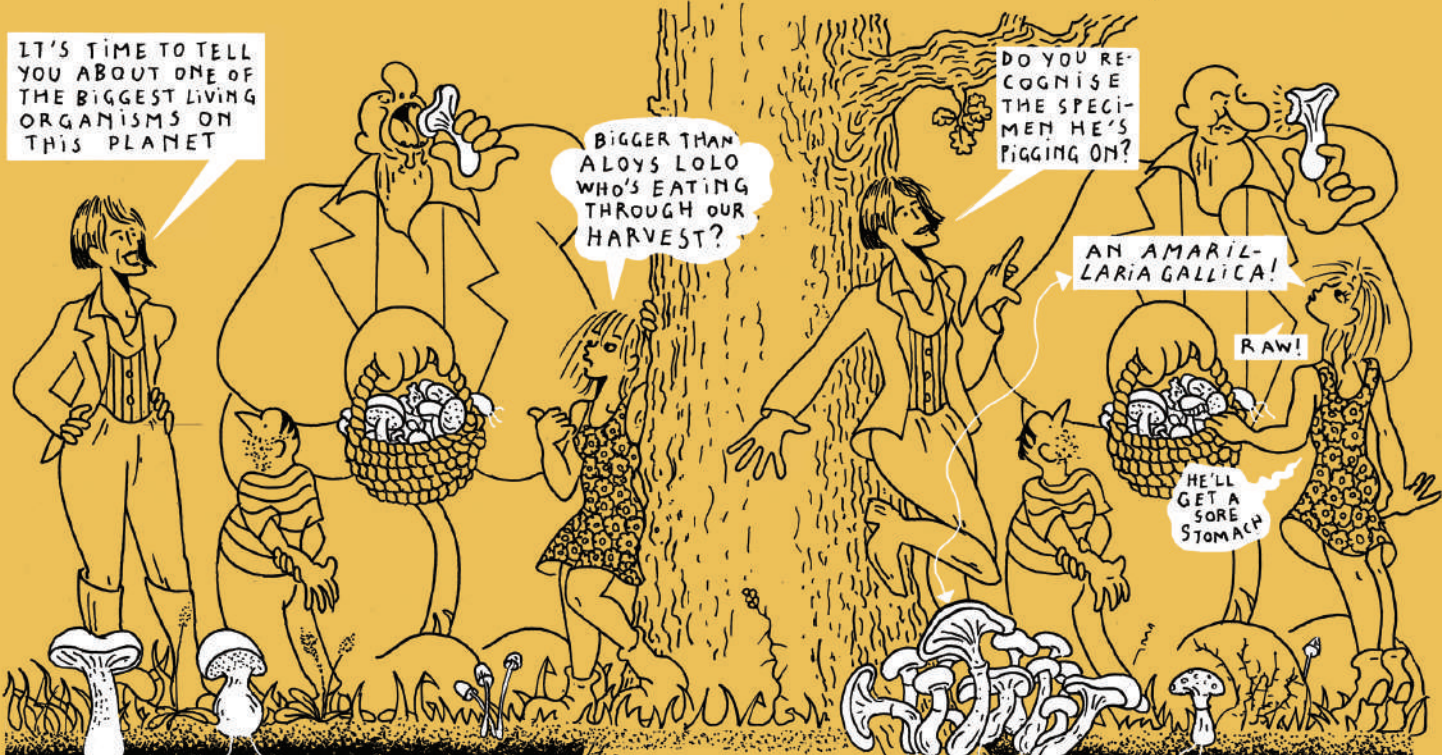
WHILE WAGING A FIERCE BATTLE AGAINST OTHER ORGANISMS

PREDATORS

OR OTHER ROTTING-ROOT FORAGERS

BY RELEASING PLATOONS OF ANTIMICROBIAL OR ANTIFUNGAL PRODUCTS

AMONG THEM: MELLEOLIDES!



IN OTHER WORDS, TERPENES

IT'S WHAT GIVES TREE RESIN ITS CHARACTERISTIC SCENT!

HOW DOES ARMILLARIA MAKE ITS MELLEOLIDES?

IT BEGINS BY CYCLIZING THE UNIVERSAL PRECURSOR: FARNESYL DIPHOSPHATE

IN ONE OF THE MOST COMPLEX REACTIONS IN NATURE BY THE WAY!

COOL, TELL ME ABOUT IT

NOPE. ANOTHER TIME

THE ENZYME THAT CYCLIZES THE PRECURSOR IS A TERPENE SYNTHASE: DELTA(6) PROTOILLU-DENE SYNTHASE

THIS IS THE FIRST ESSENTIAL STEP LEADING TO THE SYNTHESIS OF MELLEOLIDES

BY PLAYING AROUND WITH THEM, YOU CAN GENERATE FURTHER STRUCTURAL (HENCE FUNCTIONAL) DIVERSITY

CURRENTLY, WE KNOW ABOUT 50 DIFFERENT MELLEOLIDES

NO-ONE REALLY KNOWS HOW THEY WORK, BUT WE DO KNOW THAT SOME INHIBIT PROTEIN SYNTHESIS

Ho!

ARMILLARIA'S DIGESTIVE EFFORT ON DAMAGED TREES HELPS TO REGENERATE FORESTS

I SEE

BRILLIANT!

AH YES!

BY INJECTING CARBON BACK INTO THE SOIL!

ANOTHER WELL-WRAPPED STORY ON A PROTEIN!

LET'S HOPE ALOYS FINDS A PUNCH-LINE!

ZZZZZZZZ