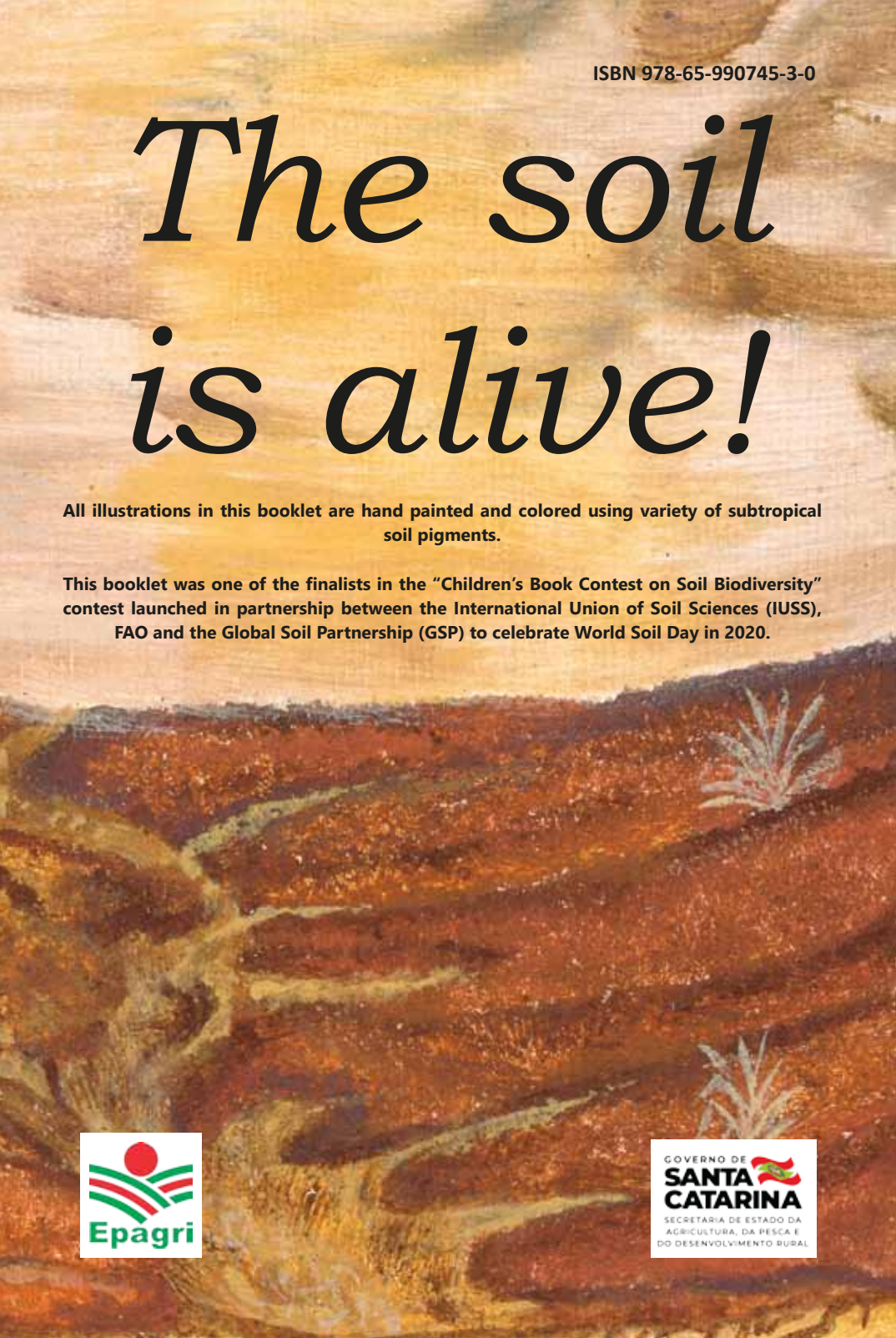
ISBN 978-65-990745-3-0

The soil is alive!

All illustrations in this booklet are hand painted and colored using variety of subtropical soil pigments.

This booklet was one of the finalists in the "Children's Book Contest on Soil Biodiversity" contest launched in partnership between the International Union of Soil Sciences (IUSS), FAO and the Global Soil Partnership (GSP) to celebrate World Soil Day in 2020.



GOVERNO DE SANTA CATARINA
SECRETARIA DE ESTADO DA AGRICULTURA, DA PESCA E DO DESENVOLVIMENTO RURAL

Governor
Carlos Moisés da Silva

State Secretary for Agriculture, Fisheries and Rural Development
Altair Silva

President of Epagri
Edilene Steinwandter

Directors

Célio Haverroth
Institutional Development

Giovani Canola Teixeira
Management and Finance

Humberto Bicca Neto
Rural and Fishing Extension

Vagner Miranda Portes
Science, Technology and Innovation

Epagri
Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina

ISBN 978-65-990745-3-0
April/2021

The soil is alive!

Book ranked seventh in the “Children’s Book Contest on Soil Biodiversity” in an activity commemorating the World Soil Day - 2020

Argeu Vanz
Elisângela Benedet da Silva
Leandro do Prado Wildner
Josiane de Souza Passos
Leonir Claudino Lanznaster
Liagreice Pereira de Medeiros Cardoso
Célio Haverroth

Agricultural Research and Extension Service Enterprise of the State of Santa Catarina
Florianópolis
2021

Agricultural Research and Extension Service Enterprise of the State of Santa Catarina
Rodovia Admar Gonzaga, 1347, Itacorubi, Caixa Postal 502
88034-901 Florianópolis, SC, Brasil
Fone: (48) 3665-5000, fax: (48) 3665-5010
Site: www.epagri.sc.gov.br

Published by Epagri´s Marketing and Communication State Department (DEMC)

Technical publishers: Lucia Morais Kinceler e Márcia Janice Freitas da Cunha
Illustrations and paintings: Kátia Marly Zimath De Mello e Ilaini Marli Maihack Brassiani

English translator: Nicolas Rossi Haverroth

English reviewers: Lucia Morais Kinceler e Márcia Janice Freitas da Cunha Varaschin
Portuguese reviewer: Laertes Rebelo
Layout and Graphic Designer: Rogério Marcos Lenzi

Printing: Gráfica CS
Number of Copies: 500

Catalog card

VANZ, A.; DA SILVA, E.B.; WILDNER, L. DO P.; PASSOS, J. DE S.; LANZNASTER, L.C.; CARDOSO, L.P. DE M.; HAVERROTH, C. **The soil is alive**. Florianópolis, SC: Epagri, 2021. 16p.

Biodiversity; Conservation; Water; Children; Environmental education

ISBN 978-65-990745-3-0

O

Presentation

This publication aims to present a book for children on soil, as a natural resource. The book results from the experience of a multidisciplinary group of Epagri´s technicians, working on Soil and Water that supports initiatives of public schools on environmental education. As a pedagogical support, the publication will reach not only technicians who work with early childhood education, but also will serve for parents, uncles, grandparents and all those who feel motivated by the theme. It provides the reader with a playful understanding of the environment and the anthropic aspects that involve the formation and maintenance of the soil biodiversity, and the importance for the maintenance of life in rural and urban spaces. All illustrations were drawn and colored by hand by Epagri extensionists using a variety of pigments extracted from Santa Catarina soils, transformed into ink called “earth colors”. As a result of this collective effort, the book was ranked seventh among the ten finalists in the “Children’s Book Contest on Soil Biodiversity” launched in partnership between the International Soil Science Union (IUSS), FAO/UN and the Global Alliance for Soils (GSP) to celebrate the World Soil Day on December 5, 2020.

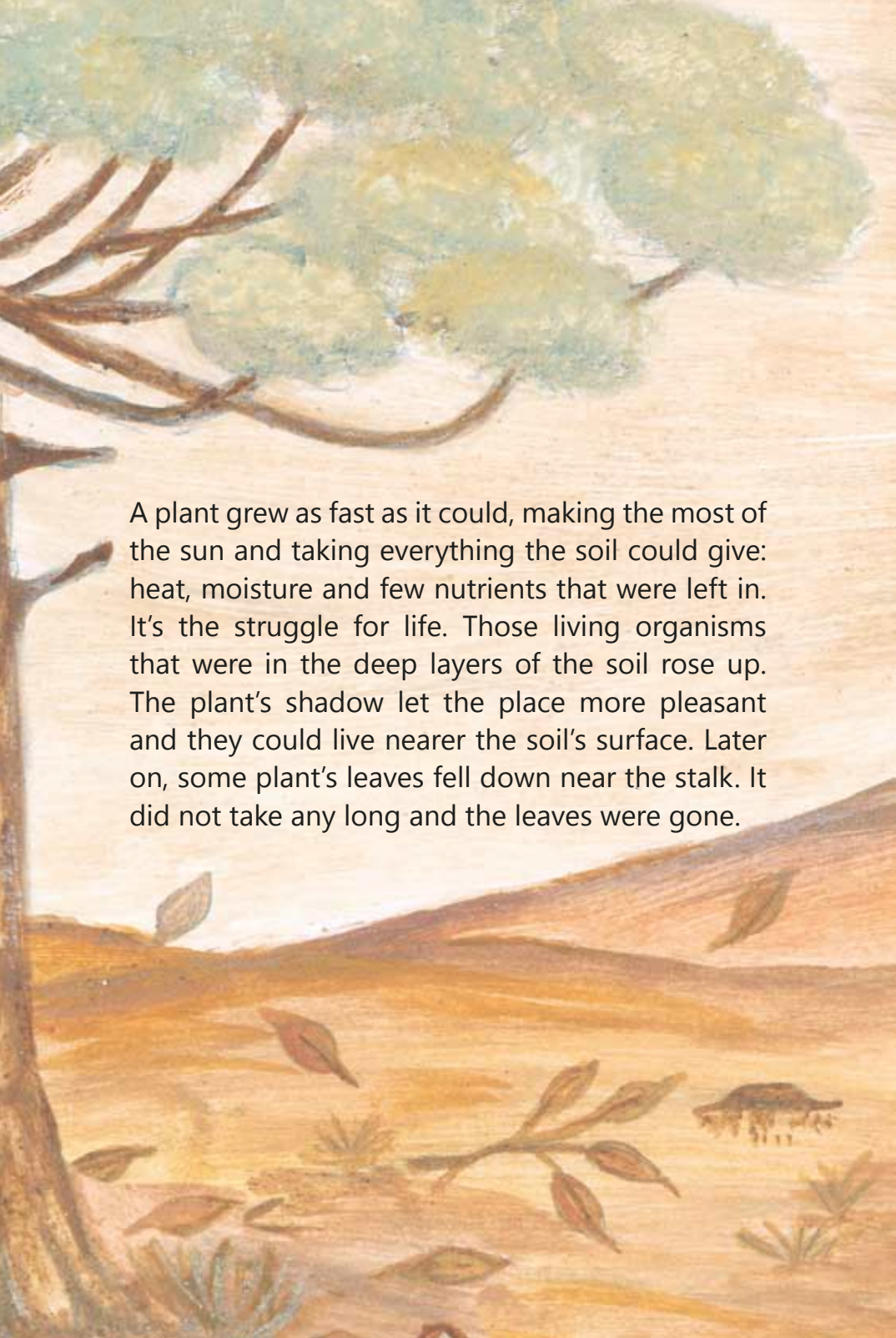
Epagri´s Executive Directors

The story I am going to tell you now takes place in the shadow and in the darkness. Different from many other stories that also take place in shadow and darkness, this one is important to maintain life on Earth and in the soil where we step.

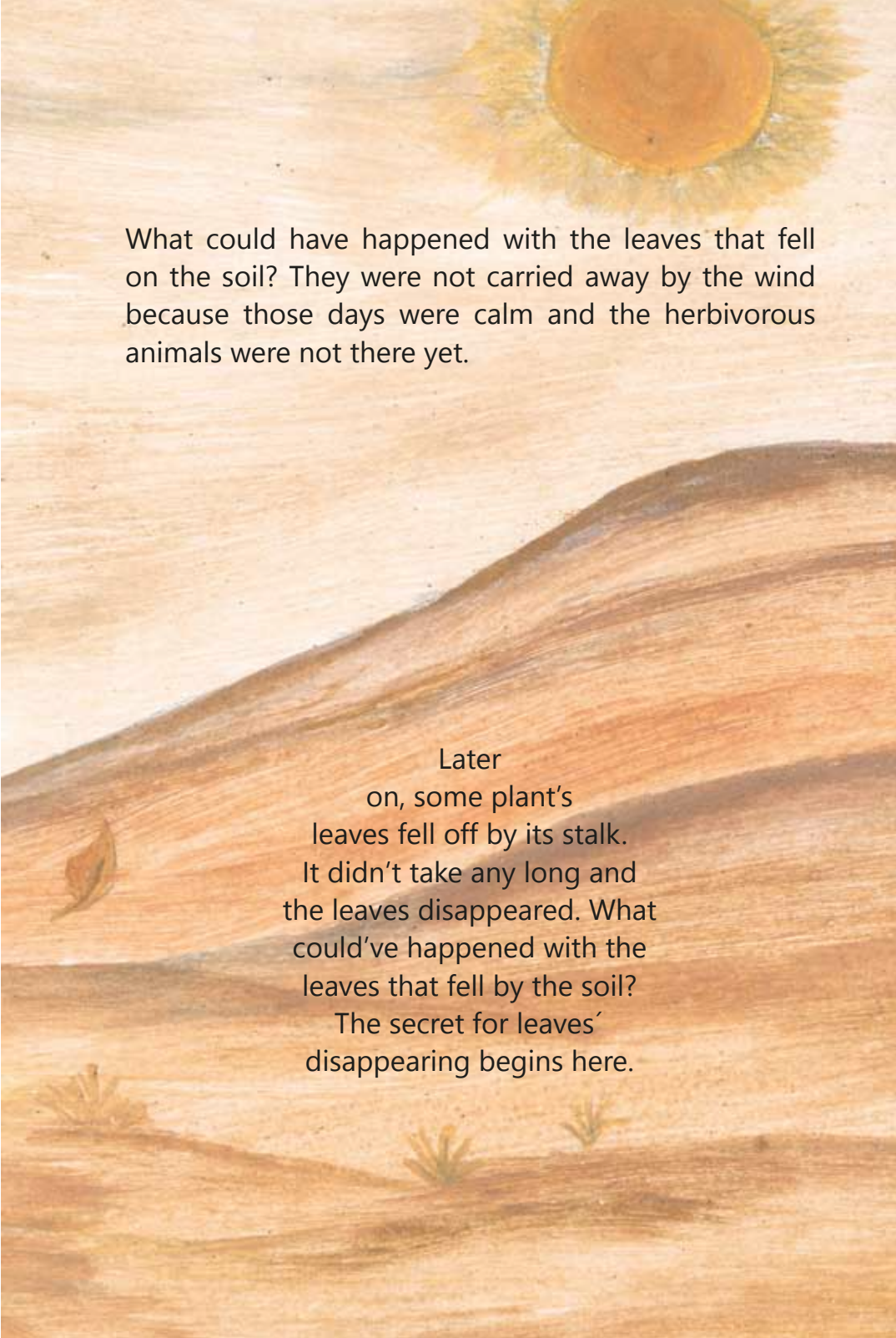
There was a place, in a very far country, that was devastated by the sun and by the rain. That place did not have any vegetation, only dry leaves that were brought by the wind. The hot sun did not let anything rise and grow and the heavy rain carried the soil away creating craters and ditches on the ground and leaving just a hard soil behind. Not only the soil was removed by erosion, but any living soil organisms were also dragged away. The few ones that managed to stay had to seek shelter in the deepest layers of the soil.

Every
morning a
bird used to fly over
this place. One day he was
late and left in a hurry for
his daily task with the rest of
his breakfast still in his beak.
Careless, he let his snack fell
on that
injured place.
It was a seed.

Nothing would have
mattered if it didn´t have
rained calmly few days before.
The soil was moist. The seed that
had fallen, rolled down and stopped.
Feeling the moisture, it wasted no time.
Soon it launched its root and released
leaves: the seed germinated.



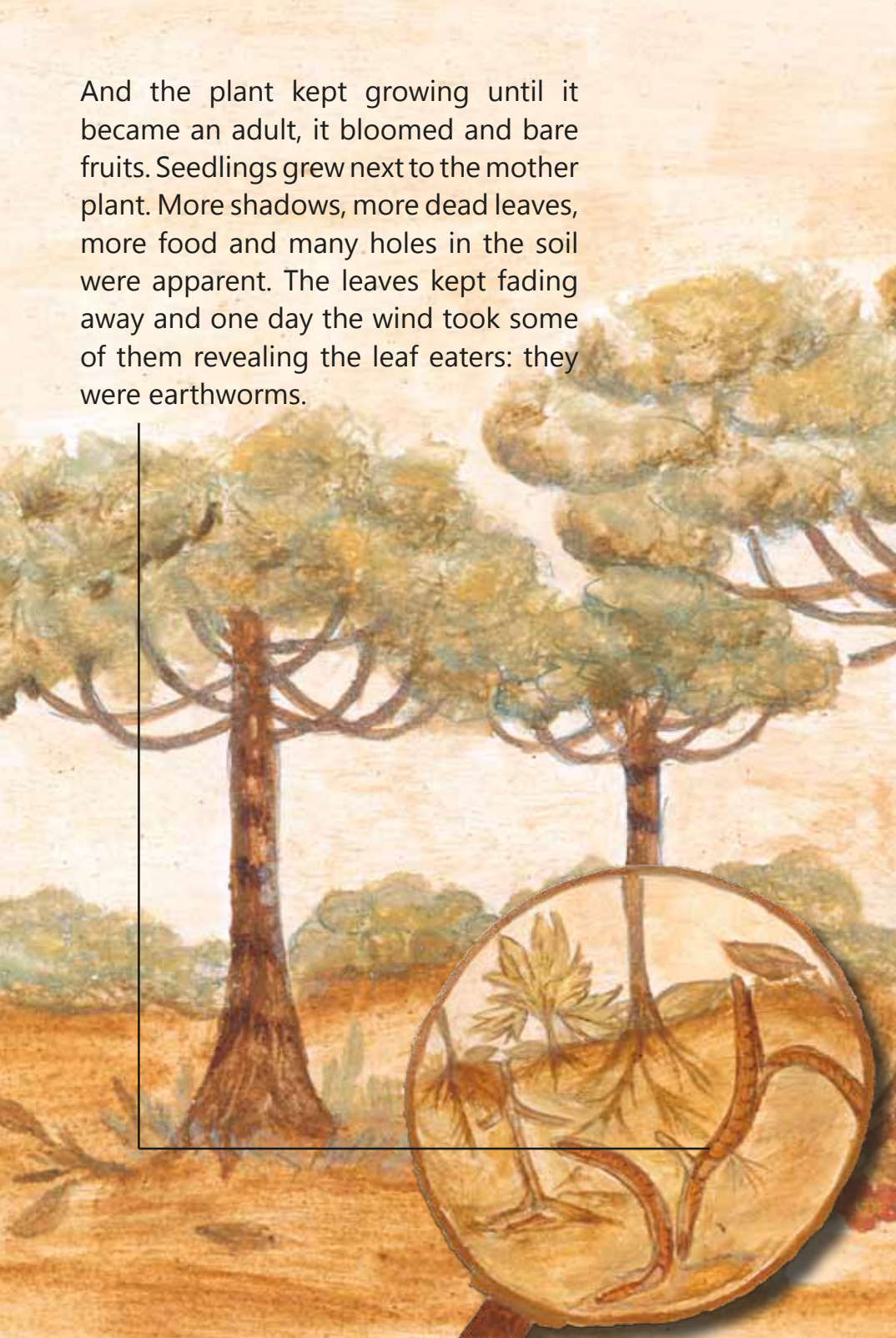
A plant grew as fast as it could, making the most of the sun and taking everything the soil could give: heat, moisture and few nutrients that were left in. It's the struggle for life. Those living organisms that were in the deep layers of the soil rose up. The plant's shadow let the place more pleasant and they could live nearer the soil's surface. Later on, some plant's leaves fell down near the stalk. It did not take any long and the leaves were gone.

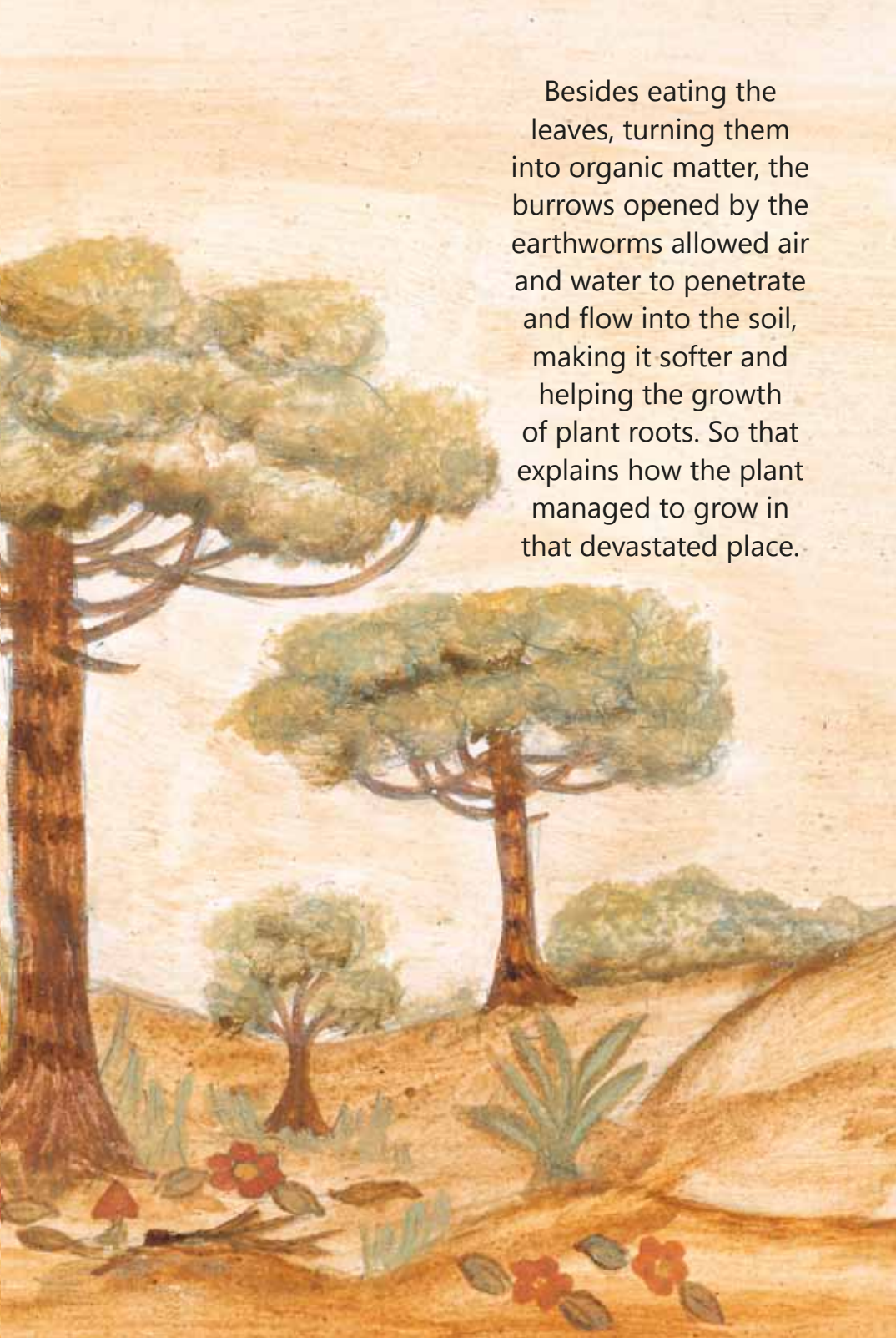


What could have happened with the leaves that fell on the soil? They were not carried away by the wind because those days were calm and the herbivorous animals were not there yet.

Later
on, some plant's
leaves fell off by its stalk.
It didn't take any long and
the leaves disappeared. What
could've happened with the
leaves that fell by the soil?
The secret for leaves´
disappearing begins here.

And the plant kept growing until it became an adult, it bloomed and bare fruits. Seedlings grew next to the mother plant. More shadows, more dead leaves, more food and many holes in the soil were apparent. The leaves kept fading away and one day the wind took some of them revealing the leaf eaters: they were earthworms.





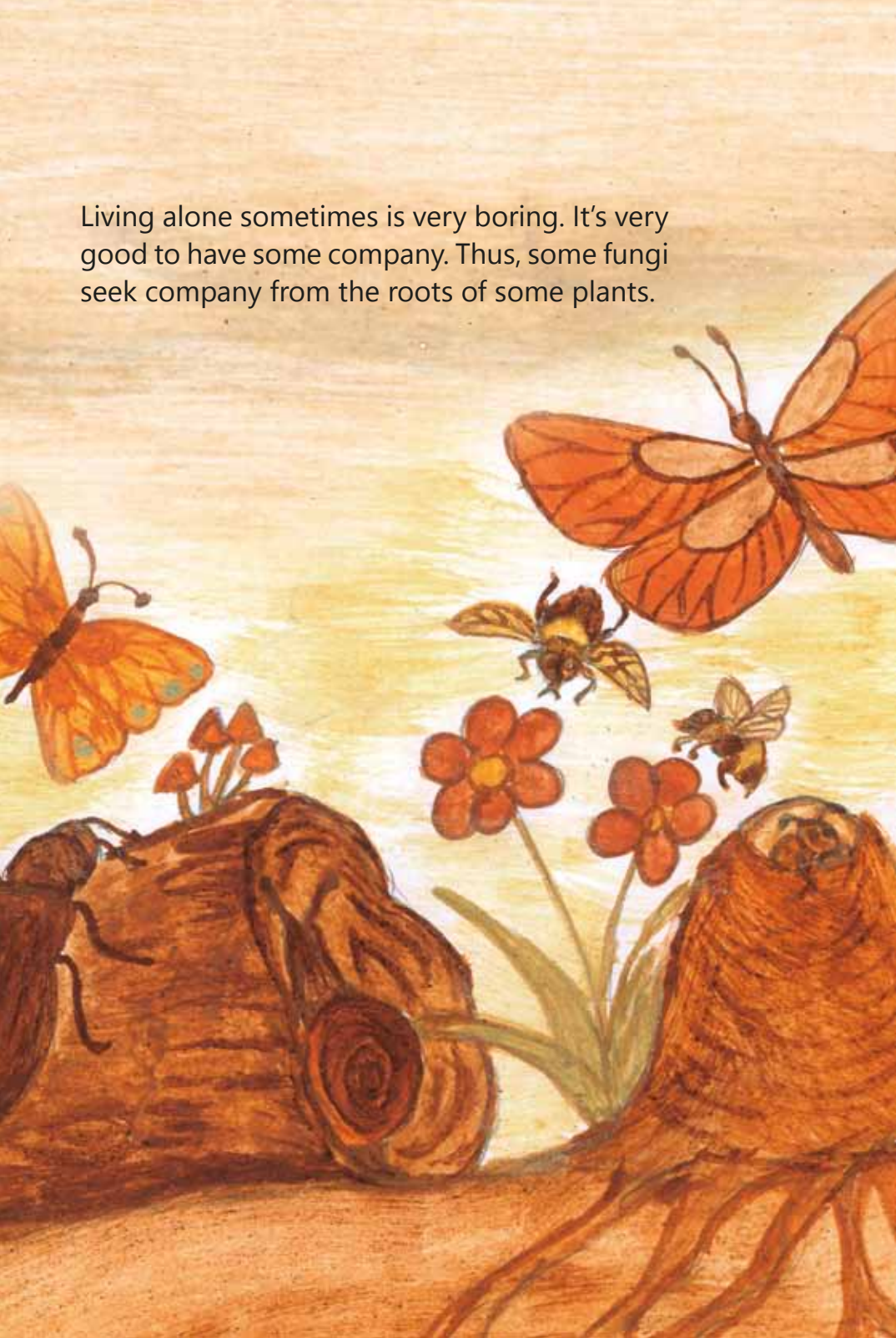
Besides eating the leaves, turning them into organic matter, the burrows opened by the earthworms allowed air and water to penetrate and flow into the soil, making it softer and helping the growth of plant roots. So that explains how the plant managed to grow in that devastated place.

There's a very important motto that says: NO ONE DOES ANYTHING ALONE. There was a large amount of leaves on the soil and the earthworms wouldn't be able to eat them all by themselves.

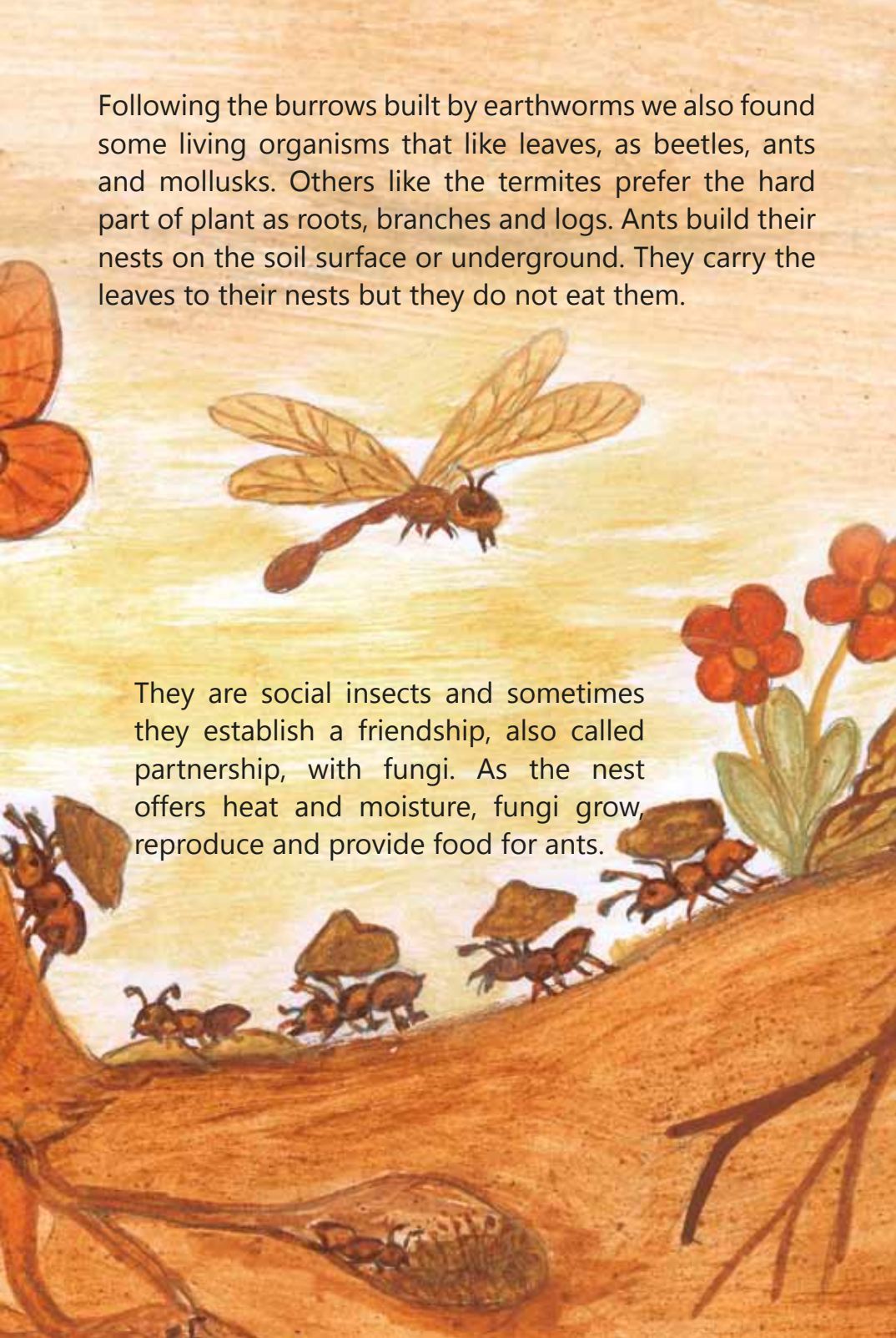
More mysteries to unveil...

To figure out who was helping the earthworms to eat all the dead leaves on the soil, we followed the burrows left by them and entered the ground. As we enter, the soil became moister and darker. It did not get very long for us to find other living soil organisms. Close to the surface we found the living soil organisms that loved moisture and heat, called bacteria, fungi and lichens. These creatures have different shapes and colors and feed, among other things, on leaves. They are also leaf eaters. They turn leaves into simple compounds to be used by plants and other living organisms.

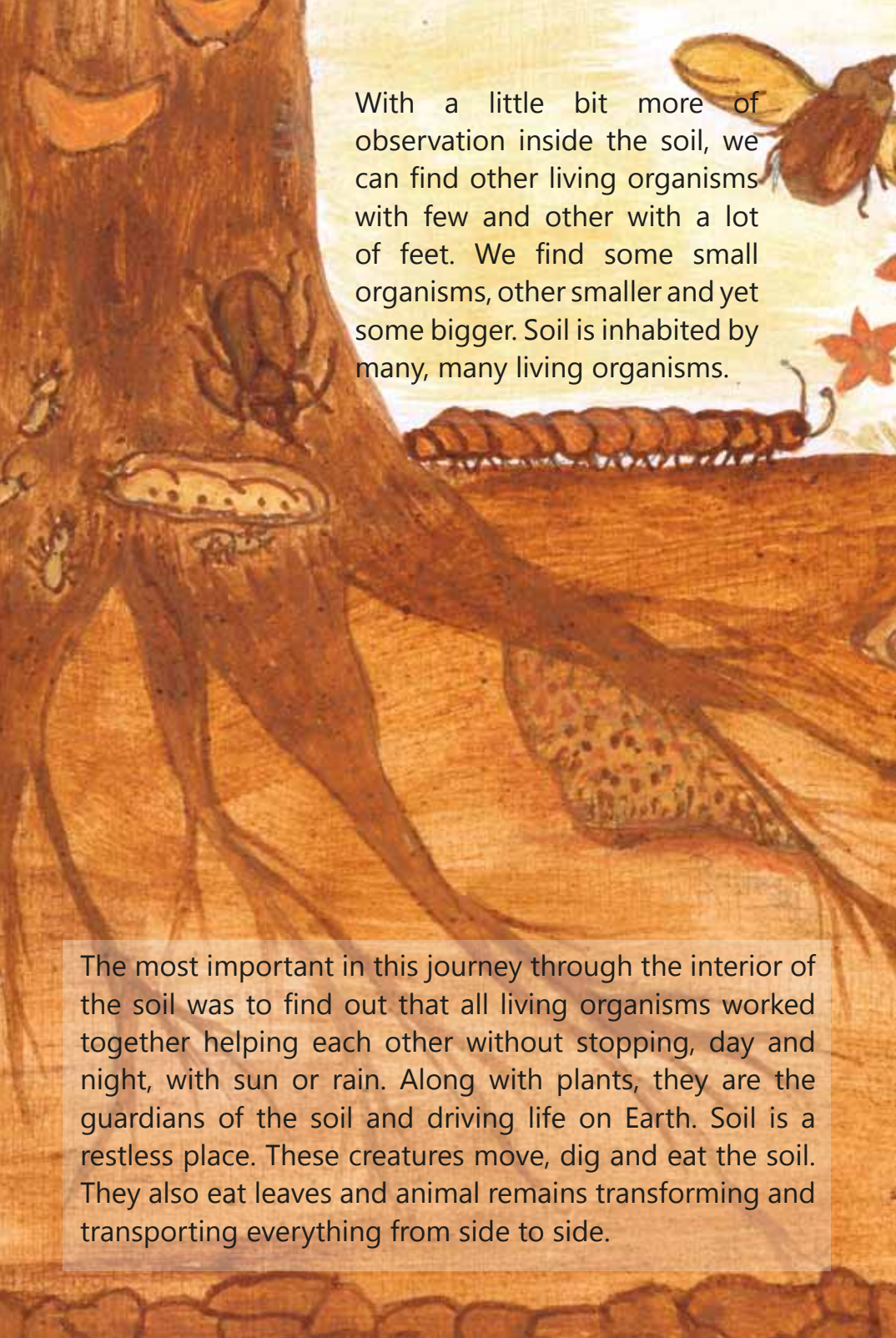
Living alone sometimes is very boring. It's very good to have some company. Thus, some fungi seek company from the roots of some plants.



Following the burrows built by earthworms we also found some living organisms that like leaves, as beetles, ants and mollusks. Others like the termites prefer the hard part of plant as roots, branches and logs. Ants build their nests on the soil surface or underground. They carry the leaves to their nests but they do not eat them.

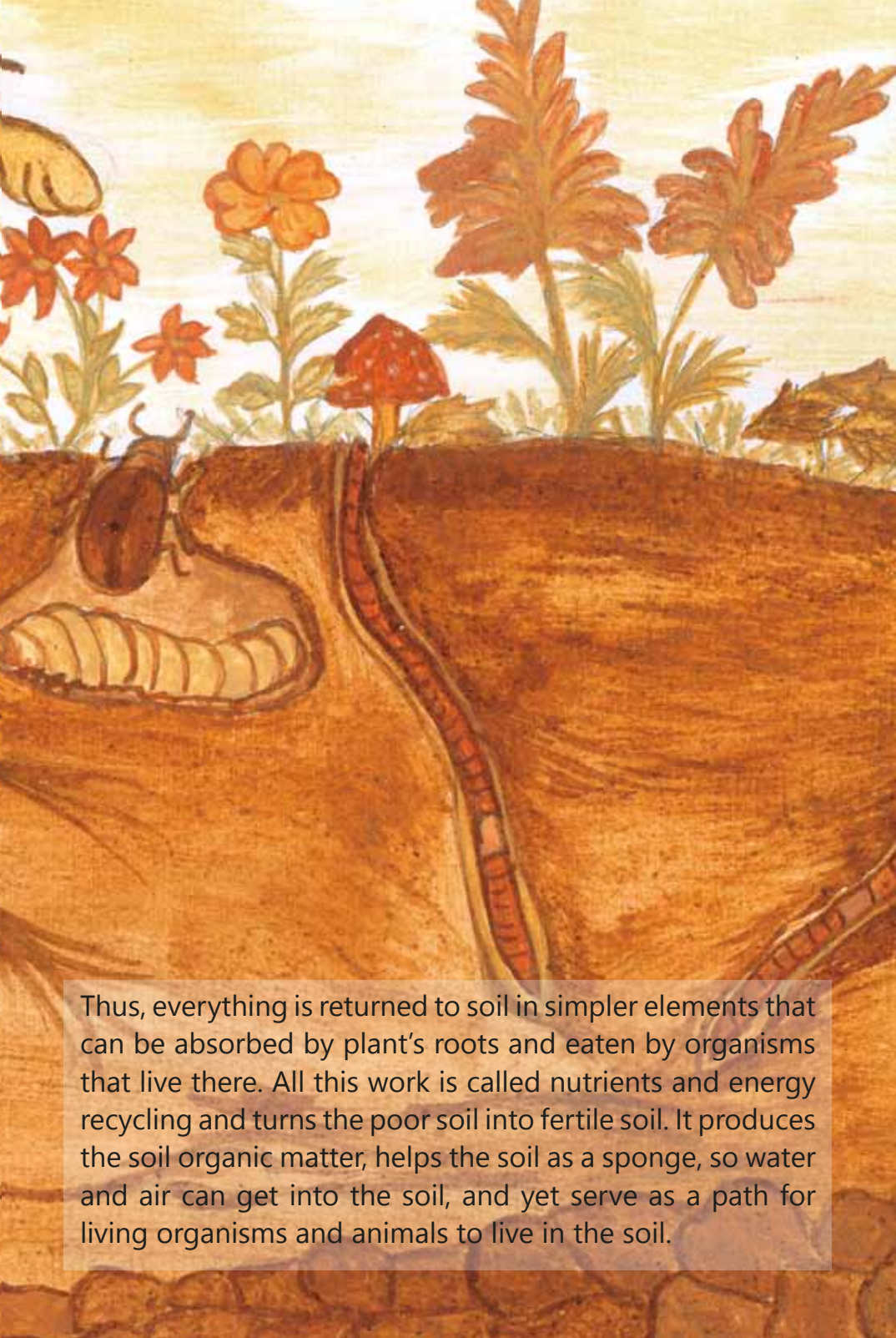


They are social insects and sometimes they establish a friendship, also called partnership, with fungi. As the nest offers heat and moisture, fungi grow, reproduce and provide food for ants.



With a little bit more of observation inside the soil, we can find other living organisms with few and other with a lot of feet. We find some small organisms, other smaller and yet some bigger. Soil is inhabited by many, many living organisms.

The most important in this journey through the interior of the soil was to find out that all living organisms worked together helping each other without stopping, day and night, with sun or rain. Along with plants, they are the guardians of the soil and driving life on Earth. Soil is a restless place. These creatures move, dig and eat the soil. They also eat leaves and animal remains transforming and transporting everything from side to side.

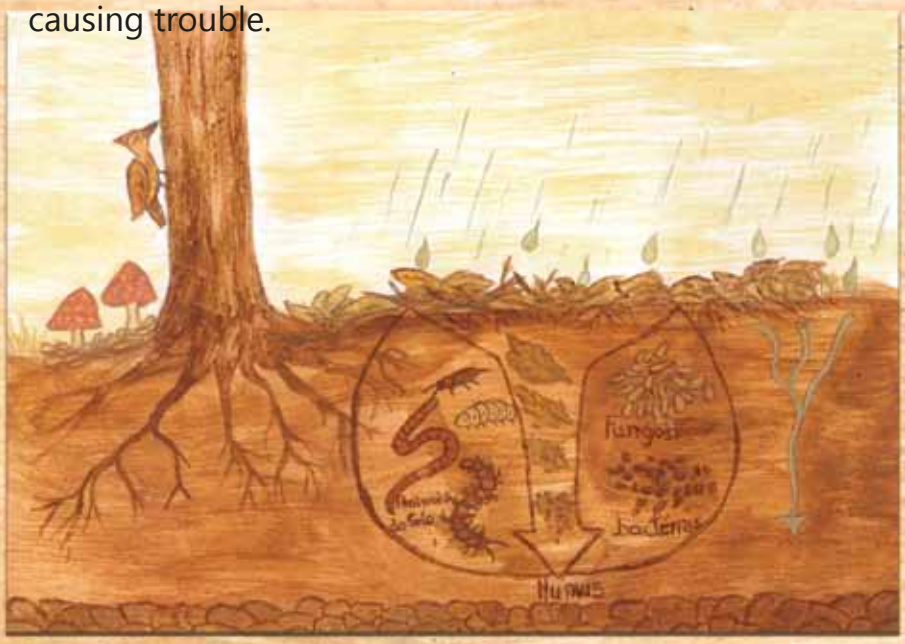


Thus, everything is returned to soil in simpler elements that can be absorbed by plant's roots and eaten by organisms that live there. All this work is called nutrients and energy recycling and turns the poor soil into fertile soil. It produces the soil organic matter, helps the soil as a sponge, so water and air can get into the soil, and yet serve as a path for living organisms and animals to live in the soil.

It was possible to see that the soil surface had been transformed and other animals could see that too. All of them were attracted by the fruits of the only plant species in that place. They did not come just to eat, they brought other seeds, which germinated on the fertile and moist soil; so, the process that occurred with the first plant was repeated. Birds came with more seeds that germinated and gave rise to more plants. It was becoming diverse, biodiverse: many species, many lives and many relationships. Biodiversity grew as each new living organism and animal arrived.

After a while, seeds of new plant species and other organisms emerged, and they were not brought by any being. They were brought by the wind. Among them, more bacteria, fungi, the orchids, bromeliads and other tree species... increasing the biodiversity of that place.

Now, the heavy rain and the hot sun were no longer causing trouble.



In that place, by night, so much happened, but it was at sunrise that a party started... sounds of all kinds echoed in that place, announcing a new day and joy of being there. Plants radiated a brilliant green, but it was in shadow and darkness of their roots that the greatest secret was hidden. It was their occult friends that ran the party. A perfect symphony that seeks a conductor for the party to never end: YOU! For this music not to stop, Keep soil alive, protect soil biodiversity.

If you want to know more about how biodiversity is important to KEEP SOIL ALIVE, PROTECT SOIL BIODIVERSITY see the Global Soil Biodiversity Atlas and follow the Global Soil Biodiversity Initiative (www.globalsoilbiodiversity.org).

www.epagri.sc.gov.br

www.youtube.com/epagritv

www.facebook.com/epagri

www.twitter.com/epagrioficial

www.instagram.com/epagri

linkedin.com/company/epagri

http://publicacoes.epagri.sc.gov.br