

# ARMADILLIDIUM KLUGII CARE INSTRUCTIONS



## Your Isopod Package Includes:

- 12-15 *A. klugii* (*Dubrovnik*) in a starter container with some food
- A starter amount of blended substrate from our lab, which only includes enough for your isopods to last for a week or so. Please rehome ASAP.
- Possibly some springtails (tiny, beneficial jumping invertebrates which cohabitate in a bioactive unit with your worms)

## Things You Need:

- a larger, new habitat: minimum 20 h x 20 w x 25 l in CM for a starter size. Plastic tote type containers work well.
- spoon or scoop for scooping dirt or picking up your new friends
- food and substrate
- chopsticks, spoons, or forceps to help you dig around in the dirt
- a spray bottle with mist function, in case your soil gets dry

## WHEN THEY ARRIVE

**Check them over:** make sure they are alive and scurrying around. They have limited food and habitat in the little cup (wood and leaves from a hardwood tree such as oak or apple, substrate, and some veggie scraps). This is only enough for a week or so, until you have your supplies for a large home gathered. Please rehome your isopods as soon as possible: the more space, the better.

## Immediate Needs:

- Keep your isopods between 18 and 25 degrees.
- Put them somewhere quiet, and in low light. Klugii are particularly shy isopods and very much prefer the dark!
- Klugii (also called “clown” for their white spots) isopods like a strong moisture gradient so please ensure there is ample damp substrate over at least 1/3-1/2 of the enclosure. Isopods breathe through modified gill-like structures: ensure there is access to a humidity gradient (wet spot) at all times. Humidity levels need to be fairly high (50-75%; so, keep the lid on) at all times. **They always need moist dirt.** If you notice the dirt drying out on top, spray it with water until you see condensation forming.

## ENCLOSURE

### The Substrate

Proper bedding is critical in maintaining the health of your isopods; it is their primary food source, it is their main source for hydration, and it is also where they live. Quality substrate is the most important care factor in maintaining and growing your population of isopods.

Your isopods only have enough substrate for shipping: you’ll need to expand on that. The mix you have been given is approximately a 1:1:1 blend of decomposing leaves, wood, black earth. Suitable substrates you blend and use:

- clean black earth potting soil (no chemicals, no fertilizer; usually available at garden centres) and coconut coir (can be found at greenhouses, hydroponic stores, pet stores).
- orchid bark or other shredded hardwood (decayed is best; no cedar)
- a handful of clean sand for grit
- Sphagnum moss
- Ground cover: *Klugii* are very shy. They need lots of hides. Provide bark, dried leaves, moss, rotten pieces of wood, or cork pieces from a pet store.

Wherever possible, use hardwood species, as it is most nutritious.

Be cautious collecting things from the wild: a lot of leaf litter or wild-collected materials are going to be contaminated with runoff, herbicide, or pesticide.

Cuttlebone: crumble some in (available in the bird section at pet stores). Isopods need calcium.

### The Container

Your isopod habitat should have a lid, be waterproof, and ventilated. Plastic totes/shoebboxes work well. A minimum starter size is 20x20x25 CM; bigger is better.

Ventilation is also important: the isopods need air, so don’t seal them into a container with no holes. Nor should the container be completely open: it will dry out too quickly, and they will desiccate. Keep an eye on them, and modify the amount of ventilation as you get used to how quickly your substrate is drying out.

Do not use a bin made of wood – they cannot climb plastic or glass, but they can climb wood.

### Habitat Issues

The main issue is dehydration in captivity. Avoid this by keeping at least one section of the substrate moist at all times.

## FOOD

**BASICS:** Isopods are detritivores, which means their primary food is rotting dead plant matter, which should be in the habitat itself. They will also eat small amounts of rotten organic waste such as dead animals, proteins, and certain fruits and vegetables. You can exploit this to compost your kitchen scraps.

*A. klugii* are slow eaters, and very small. Offer small amounts of veggies and fruit as supplementary food (the size of a dime) at first, and then monitor them in the coming 3-5 days. Any moldy food should be removed.

DO FEED:	DO NOT FEED:	NOT MUCH OF:
-Cuttlebone (should always be available) -Squash -Apple -Pear -Melon -Cucumber -Avocado -Lettuce -Carrot	-Citrus Fruits -Onions -Potato -Oil -Butter -Meat or Fish -Pet/Human Waste -Cheese -Wet cat/dog food (it gets stinky!)	-Protein: the best kinds are dry dog/cat/fish food - but protein should be less than 10% of the diet -Things super high in nitrogen

Don’t forget to monitor their substrate humidity! Decaying food adds moisture.

Many people have begun to exploit their eating habits by adding isopods into other animal habitats (such as herp vivariums) with varying degrees of success; for this reason they are popularly known as a “clean up crew.” Please ensure you are targeting the appropriate species to cohabitate! Isopods have needs of their own. Some species of isopods can and will injure other animals, and many will not be efficient for cleaning the animal waste you are hoping to. *Klugii* are not known to be aggressive, but may be a target of predation.

**TREATS:** There are a lot of commercial isopod foods out there, such as recipes provided by company like Repashy, or downloadable “Isopod Food” blends. In our experience these are not totally necessary, as long as the kitchen scrap diet you are feeding them is well supplemented by a good substrate blend.

## TO AVOID ODOR & FLY PROBLEMS: Do not feed more than they will eat in 1-3 days.

**Isopods make charming and entertaining invertebrate companions.** Isopod composting is also a growing field and one way to divert your food waste from the land fill. But: remember that they require care too! Do be aware that isopod waste is not well researched and it is not clear whether it will be as beneficial to your plants as pure worm castings: isopod waste is also harder to separate from the isopods themselves, as they tend to be bolder than worms alone and scurry about with gusto, making them challenging to remove.

### A Little About Isopods

- Your isopods are properly called *Armadillidium klugii*: try this name out as it really is the only one unique to this species. Wikipedia lists 23 common English names for isopods – including rollie-pollie, smooth woodlouse, and pillbug – and these are shared among many of the 5000 terrestrial species of isopod in our world. And that's just the English names! There are many more nicknames in other languages as well.
- *These* are sometimes called “clown isopods” because of their distinct patterning and white spots. They are a shy isopod; the best time to see them will be in the evening or at night, when they come out to forage.
- Isopods are not an insect, arachnid, or a millipede. They are a tiny land crustacean, so their closest cousins are shrimps, crabs and lobsters.
- Isopod bodies: they have three body parts: head, thorax, and abdomen: with seven segments on the thorax. There is 1 prominent pair of antennae (“flagellum”) at the front (you can see them waving them around and exploring their world with these) and one inconspicuous pair. They have two very simple compound eyes, and 14 legs in total. The little paired appendage at the “tail” end of the isopod is called a uropod: in males it is usually longer than on females. They breathe through primitive gill-like structures on the base of their legs.
- Your isopod's colour varies a bit, mostly in the color and intensity of the spots. Some other types of isopods have heads like ducks, some isopods have stripes like zebras... there is a lot of diversity!
- Isopods live almost everywhere all around the world, from the ocean to our backyards. Some live at high altitudes, some live-in deserts, some live under the Antarctic sea ice. This is an ancient family of animals, around since the carboniferous era, and they have adapted to a wide variety of environments.
- Not all of them can curl fully into a ball. This is an *Armadillidium* species: so it can!
- Isopods have an exoskeleton: a hard shell. They can withstand a short fall, but please be careful not to squish them!
- Female isopods have a marsupium (like a kangaroo pouch) on their belly, about 2/3 - 1/2 way down their body, in between their legs. The eggs grow and when ready, hatch inside of this pouch, upon which she “gives birth” to babies that are ready to walk around. If you look carefully and gently you might be able to see full brood pouches on mature females.

### LIFE CYCLE AND MOLTING

You will have both male and female isopods. After mating (which occurs during a female's molt cycle), the female grows eggs into a brood pouch on her underside (you can see it if you look very, very carefully; like a little white bundle in the middle of the body between the legs). The eggs develop inside this marsupium, and then stay as little mini white isopods inside until they are ready to be “born,” which is simply when the marsupium detaches and the little babies emerge. Some species of isopod have females who can reproduce asexually, without a male.

Like all animals with an exoskeleton, they must moult in order to grow; an isopod will molt 4 or 5 times to reach adulthood. Unlike most arthropods, they do not shed their exoskeleton all at once: first the back half is shed, and then in the next 2 or 3 days the front will follow. Watch for moulting individuals in your colony and avoid bothering them! You can spot a moulting isopod because the front half of the isopod will be a different colour than the back half (they moult their exoskeleton in two parts).

Moulted skins are called exuviae, and the adults will naturally eat them and recycle them as they would other decaying organic matter. Your isopods have a lifespan of approximately 2-3 years.

### HANDLING

Isopods are harmless and can be handled and observed easily as long as you are gentle.

Use a spoon or careful fingers to scoop and gently free them from the soil and deposit into your hand. They are very small and their legs are delicate, so never pinch them or press on them because you may not be able to see the damage that they can feel. Let them walk around on your fingers or hands freely; they do not appreciate being forced to stand still. They are fast walkers and can withstand a short drop. Like all arthropods, handling while they are moulting is discouraged! Immature individuals will be more fragile than the adults, so go for the bigger ones.

Sometimes you will find a mother with a full brood pouch on her belly: it will look like a fat whit-yellowish blob in between her legs in the middle of her body on the bottom. You might even be able to see the babies inside! Avoid handling gravid mothers like this.

*Congratulations on your new role as an isopod caregiver! Isopods make an easy, convenient addition to the home or learning environment: like an ant colony, but they work for you!*

*They are a wonderfully helpful little invertebrate ally we can incorporate into our daily 21st century lives, allowing us to reduce our carbon footprint by diverting landfill waste, and helping to close the metabolic gap through recycling. They are charming and whimsical to watch as they trundle about on their cute isopod business. We like to think they will trundle their way right into your heart.*

*The world of isopods is vast and interesting: enjoy your journey!*

**Your isopods cannot be released outdoors. *Armadillidium klugii* is not a native species.**

*This includes adding them into an outdoor composting bin. You are better off to attract wild isopods for that.*

Your colony has the potential to live indefinitely. Please take this into consideration: they are living creatures who have needs. Should at any point you find yourself without the ability or desire to care for your isopods, you have several options:

**-Find them a good home.** Chances are you know someone personally who would be willing to take on your compost bin. Please be sure you pass along all the information you have at your disposal.

**-Notify us, and we will** guide you through the process of getting them back to us or finding them another good home.

***Under no conditions can you release your isopods be released to the wild. This is highly unethical, and is cruel to both the animals and the environment.***