



# COCKROACH CHRONICLES



**YOUR GUIDE TO**


**THE WORLD'S MOST RESILIENT PEST**



**CANADA™**

PEST CONTROL DOWN TO A SCIENCE.®

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# 400 MILLION YEARS<sup>1</sup> AGO, COCKROACHES SCUTTLED INTO EXISTENCE —

and they've been bugging us ever since.

Ancient Egyptians cast spells to get rid of them<sup>2</sup>, Roman naturalist Pliny the Elder deemed them “disgusting”<sup>3</sup> and Aristotle even postulated about their lack of souls.<sup>4</sup> Today, it is estimated that 11% of the population suffers from katsaridaphobia: fear of cockroaches.<sup>5</sup>

And for good reason. These pests can live headless for a week,<sup>6</sup> survive without food for a month<sup>7</sup> and keep kicking through radiation levels that would kill a human in just 10 minutes.<sup>8</sup> It seems these creepy crawlers can survive it all – that is, until The Orkin Man<sup>®</sup> arrives.

In the Cockroach Chronicles, you'll learn who these characters are, where to find them and how to help keep them from sullyng your reputation. Consider it your one-stop shop for combating what we've crowned the World's Most Resilient Pest. Because, let's face it: you'll need more weaponry than just your size 10 sneakers.



# COCKROACH: CAN OR CANNOT?

We've heard it all before: cockroaches never die, cockroaches survive nuclear attacks, cockroaches wear jet packs. That last one is actually true. No, really; it was a study in 2002.<sup>9</sup>

Rumors about these pests fly faster than the speed of a cockroach – which, if we measured in body lengths, is four times faster than the speed of the cheetah.<sup>10</sup> To truly understand these formidable foes, it's time to turn the lights on and watch these cockroach myths scatter.

# CAN THEY?

## SURVIVE A NUCLEAR BOMB

CAN

CANNOT

Thanks to their unique body design and slow cell cycles, it's true that cockroaches can withstand extreme exposure to radiation. In fact, cockroaches can survive up to 100,000 radon units (rad) – whereas nuclear bombs only emit 10,000 rad.<sup>11</sup>

But, even if they survived the radiation, the temperature at the epicenter of a blast can reach over 50 million degrees Fahrenheit. That's just not survivable, even for a cockroach.<sup>12</sup>

## LIVE WITHOUT THEIR HEADS

CAN-ish

CANNOT

Because of their open circulatory system, cockroaches are not dependent on their mouths to breathe. Instead, they aspirate via little holes throughout their body segments. So, even if it's off with their heads, they'll keep breathing until they die from dehydration.<sup>13</sup>

## SURVIVE WITHOUT FOOD

CAN

CANNOT

Cockroaches get hungry just like the rest of us, but instead of three meals a day, they can survive on one meal a month. How's that for making calories count?<sup>14</sup>

## RELEASE THEIR EGGS WHEN THEY'RE STEPPED ON

CAN

CANNOT

Some cockroaches carry their eggs on their backs, so squashing the roach also means squashing the eggs. The bad news? Other species hide their egg cases across facilities.<sup>15</sup> That means you may be getting rid of the mother – but not the babies. Get ready for Gen C.

## SURVIVE IN THE WATER

CAN

CANNOT

You may think the toilet is an effective cockroach killer – but these pests will likely live to see another day. While they do require oxygen to survive, cockroaches can “hold their breath” for up to 40 minutes at a time. That may give them just enough time to find the perfect escape route: through the sewer system.<sup>16</sup>

# KNOW YOUR ENEMY

You can't go to battle without understanding your opponent. Then again, most opponents don't have six legs, four wings and an army of 4,000 species. If you're still feeling good about your cockroach combat odds... well, don't turn the page.

# A FEARSOME FRAME

From their cerci to their thorax, cockroaches' bodies are designed to move quickly, flatten efficiently and survive the unsurvivable. They're an entomological marvel – and an intimidating enemy.

## ANTENNAE

A pair of long, well-developed antennae are **cockroaches' control center**. These appendages help cockroaches detect odors, sense vibrations in the air and even measure humidity levels.

## PRONOTUM

Just behind the head lies the pronotum: a large, plate-like structure with color patterns that can help **distinguish one cockroach species from the next**.

## ABDOMEN

This houses the all-important **reproductive system**, where, depending on the species, female cockroaches can carry as many as 40 eggs at a single time. But don't expect any maternal instinct from these pests. If they're hungry enough, they'll turn to their young for a quick bite to eat.

## THORAX

Many cockroach species have two pairs of wings, yet the majority are poor flyers. But don't relax just yet; let's talk about their speed and agility. **Three pairs of legs ending in tiny claws jut out from the thorax**, allowing these creatures to scurry soundlessly at over 3 miles per hour – on the ceiling. Move over, Spiderman.

## CERCI

Cerci are sensory organs similar to the antennae. Like **a built-in alarm system**, the cerci tell cockroaches when danger is coming – and trigger their legs to start running even before their brain receives the signal.<sup>17</sup>

# ROACH ROTATION

While cockroach species may differ in appearance, habit and behavior, they all share the same basic developmental stages: egg, nymph and adult. After all, not even cockroaches are immune to that awkward adolescent stage.

## EGG

Eggs produced by female cockroaches are enclosed in resilient cases known as oothecae. Depending on the species, mothers may either carry these oothecae or store them in crevices, on ceilings or behind cabinets.

## NYMPH

Otherwise known as young cockroaches, nymphs are similar in appearance to their adult counterparts but may lack certain physical traits, like wings. To be clear, they do not get them every time a bell rings.

## MOLTING

As nymphs grow, they shed their exoskeletons. This “molting” process varies in duration depending on the cockroach species, with some undergoing as many as 13 molts over a period of 18 months.

## ADULT

After the final molt, these insects emerge as sexually mature, adult cockroaches. Cockroaches generally have a life span of between six months to one year.<sup>18</sup>



### Robo-Roach

A group of UC Berkeley researchers have used cockroaches as their inspiration for a series of robobugs, aptly named “roach bots.” They hope to use these durable robots to conduct search-and-rescue missions in disaster zones.<sup>19</sup>





# THE COCKROACH CREW

There are over 4,000 cockroach species in the world – but only 0.5% of those interact with humans.<sup>20</sup> Of those, five primary species live, breed – and yes, infest – North American businesses.

Meet your odious Cockroach Crew: the American, German, brown banded, Oriental and smokybrown cockroaches.

# AMERICAN COCKROACH

(PERIPLANETA AMERICANA)

American cockroaches were introduced via ships in the early 1600s, with even John Smith of Jamestown complaining of a vile-smelling *cacarootch*.<sup>21</sup>



True to their namesake, American cockroaches have a particular penchant for fermenting food and liquids – including beer. Bottoms up.<sup>24</sup>



## APPEARANCE

With a body size that can measure **up to 3 inches long**, the American cockroach is the largest of all common structure infesting species.



## LIFE CYCLE

American cockroach **egg cases contain 14-16 eggs**, with nymphs undergoing 13 molts before reaching sexual maturity.



## BEHAVIOUR

Introverts of the cockroach world, American cockroaches tend to **live in solitude**.<sup>22</sup> That said, they can't resist a good housewarming party; more than 5,000 cockroaches were once found in a sewer manhole.<sup>23</sup>



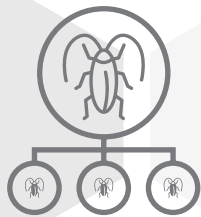
## HABITAT

From pipes to food processing facilities, American cockroaches can make **virtually any location their home**. However, they do prefer 70-80-degree weather (don't we all?).

# GERMAN COCKROACH

(BLATELLA GERMANICA)

No country wants to take credit for the German cockroach, the most widespread roach species in the world. In Germany, these roaches are referred to as Russian cockroaches; in Russia, they're referred to as Polish roaches.<sup>25</sup> Oh *nein*.



It is theoretically possible for one female German cockroach to produce more than 300,000 cockroaches in a single year. Imagine that family reunion.<sup>26</sup>



## APPEARANCE

German cockroaches are light brown with two dark stripes running across their pronotum. About half an inch in length (14mm), **they're considered one of the smaller species** of roaches.



## LIFE CYCLE

A tremendous breeder, female German cockroaches **produce egg cases that contain up to 40 eggs**. These eggs are then carried by mama cockroach until the day they are born.



## BEHAVIOUR

German cockroaches deposit **pheromones in safe gathering places**, alerting fellow cockroaches to habitable territory. These pheromones just so happen to be found in their feces, because nothing says "home sweet home" like a used bathroom.



## HABITAT

Drawn to warm and humid environments, German cockroaches seek **readily available water sources and accessible hiding places**.

# BROWN BANDED COCKROACH

(SUPELLA LONGIPALPA)

An entomological Easter egg hunt, brown banded cockroaches hide themselves and their eggs in cracks and crevices throughout buildings.



**Move over, bookworms.** Brown banded cockroaches prefer food with higher starch content, including book bindings, wallpaper glue and stamps.



## APPEARANCE

What's in a name? Their moniker stems from the **two distinctive brown bands covering their wings**. They're roughly the same size as German cockroaches.



## LIFE CYCLE

Squash a brown banded cockroach? There's more where that came from. This species **glues their egg cases to inconspicuous hiding places on furniture, walls and ceilings**. In a short time, those eggs will deliver a new wave of intruders.



## BEHAVIOUR

**Male brown banded roaches are able to fly**, but females stay grounded.



## HABITAT

Requiring less water than German cockroaches, brown banded cockroaches lurk in warm, dry areas. Their favorite **hiding spaces tend to be in cabinets, around appliances or within furniture**.

# ORIENTAL COCKROACH

(BLATELLA ORIENTALIS)

Better known as waterbugs, Oriental cockroaches are the full roach package: black, slimy and smelly. Plus, they like to emerge from sewers.



Don't let the name fool you.  
These cockroaches likely  
originated from North Africa.



## APPEARANCE

Oriental cockroaches are dark red-brown or black, with a “greasy” sheen to their exoskeleton. They're about **double the size of German and brown banded roaches**.



## LIFE CYCLE

These cockroaches produce fewer offspring than their counterparts, **only creating up to eight egg cases in a season**.



## BEHAVIOUR

Compared to other cockroaches, Oriental cockroaches are considered, well, sluggish (no offense to slugs). They're **rarely found on upper floors and ceilings**, opting instead to stay close to the ground.



## HABITAT

As the “waterbug” nickname suggests, **these pests enjoy humid, moist locations**, including sewers, basements and crawlspaces.



# SMOKYBROWN COCKROACH

(PERIPLANETA FULIGNOSA)

A true Southerner, the smokybrown cockroach prefers living in Texas, Georgia, North Carolina and Florida. That said, they've been spotted as far west as Los Angeles, California. Consider it the Hollywood Crawl of Fame.



## APPEARANCE

Their name comes from their **gleaming brownish-black exterior, which is accented by two wings** – that, unlike most other cockroach species, actually work for flying.



## LIFE CYCLE

On average, the female will produce **10 egg cases, with each containing about 20 eggs**. Developmental time varies by temperature, ranging from 160 to 716 days.



## BEHAVIOUR

Unlike other cockroaches, smokybrowns are **attracted to light** – maybe that's what sent them to Hollywood. They're known to dart into buildings with lights left on. Now that's motivation to conserve electricity.



## HABITAT

Smokybrowns generally **live outdoors in protected, moist areas, like a treehole**. But if you think you'll only find them outside, you're barking up the wrong tree. These pests are known to fly into attics or slide through foundation crevices.



Ah-choo! In Japan, smokybrown allergens are believed to trigger 15-20% of asthma attacks.<sup>27</sup>

# THE RISK OF ROACHES

Mosquitos are the deadliest pest in the world, and rodents cause the most economic damage. But cockroaches? They can poison your food, trigger your allergies – and ruin your reputation. Here's how:



## HEALTH HAZARDS

**Food Poisoning:** Cockroaches are what we call “opportunistic scavengers:” the scientific term for “they’ll eat just about anything, anywhere.” With the world as their all-you-can-eat buffet, they’ll dine on anything from discarded food to cat feces.

After dining, dangerous bacteria can stay in their systems for up to one month. They then transfer these germs to human food and surfaces, spreading a whole host of bacteria, including *Salmonella*, *Staphylococcus* and *Streptococcus*.<sup>28</sup> In fact, cockroaches have been reported to spread at least 33 kinds of bacteria, six kinds of parasitic worms and seven other kinds of pathogens.<sup>29</sup>

**Asthma:** Stop and smell the – cockroaches. Proteins in crushed cockroach body fragments and feces become components of dust around households and commercial facilities. After inhaling these particles, sensitive children and adults develop a series of allergic reactions, with some even escalating to asthma. For the 25+ million North Americans afflicted by allergies, the presence of cockroaches can be downright threatening.<sup>30</sup>



## REPUTATION RUINERS

Think a 1-inch bug won't have a huge impact on your business? Newsflash: the internet is crawling with cockroach headlines:

cockroaches ruin businesses



About 1,900,000 results

**Restaurant report: Dirt, black residue & live cockroach** (Harrisburg, Pa.)

**Neighbors stomp ‘thousands’ of cockroaches in street** (Petersburg, Virginia)

**Cockroaches are invading game consoles – here’s how to keep them out**

**Man orders a cappuccino, gets a side of cockroach** (New York, New York)



# MISSION IMPOSSIBLE: ROACH REVEAL

These insects spend 75% of their time in hiding, oftentimes only emerging under the cloak of darkness.<sup>32</sup> But we have good news: The Orkin Man® carries a big flashlight.



# THE COCKROACH CROSSROADS

“How did cockroaches get in here?” is one of the most common questions we hear.

Chances are they were born right inside your building. But if you’re wondering how their great-great-great grandmother arrived, she may have smuggled herself in one of these ways:



## PACKAGES

While food shipments are always attractive, cockroaches – like toddlers – will settle for just a good ol’ cardboard box. Considering how many shipments your business receives, it’s not hard to imagine some of them contained unwanted hitchhikers.



## PEOPLE

Do you have many people coming and going through your facility? It only takes only one female adult cockroach to hop aboard a visitors’ briefcase – and then stay long-term with their entire extended family. And worse: they won’t pay rent.



## PLUMBING

Sewers are an all-time favorite for these filthy flyers (well, mostly non-flyers). When repairs are being made to the sewer system, displaced cockroaches will begin entering buildings.



## PENNY-SIZED CRACKS

Certain cockroaches can squeeze themselves into gaps as small as two stacked pennies.<sup>33</sup> This means that any exterior opening, whether alongside window panes, beneath lobby doors or even within foundational concrete, are fair game.



## PEERS

Sometimes you can do everything right, but you’ll just get downright unlucky. If there are nearby homes, buildings or warehouses infested, you may be getting some unexpected visitors.

# FOUR SIGNS OF AN INFESTATION

Once inside, a single female German cockroach could theoretically produce up to 300,000 roaches – in one year.<sup>34</sup> You better get to inspecting.



## FECAL DROPPINGS

Your floor isn't mysteriously covered in black pepper. Smaller cockroaches produce feces similar in size and appearance to ground coffee, whereas larger roaches will leave droppings comparable in size to those of mice (no exagge-rat-ion).<sup>35</sup>



## EGG CASINGS

When cockroach nymphs emerge from their oothecae, they leave their casings behind. Check for these brown, oblong casings behind furniture, in between cracks on walls and in other tight, protected areas.



## MUSTY SMELLS

Eau de Roach: the world's most reviled perfume. Certain roaches, such as the Oriental cockroach, can produce a pungent odour akin to musty oil. Dead roaches may also give off a putrid scent, as oleic acid is produced during their decomposition.<sup>36</sup>



## ROACHES THEMSELVES

This may seem like a no-brainer, but it's rare to spot a roach in the daylight. This is for two reasons: 1) roaches tend to be nocturnal creatures, preferring to scuttle after sundown, and 2) roaches spend about 75% of their lives in hiding.<sup>37</sup> Spotting a roach during daylight hours may be a sign of a full-fledged infestation.

# YOUR COCKROACH CHECKLIST

While cockroaches could squeeze into virtually any nook or cranny, there are a few top locations that cockroaches choose to call home. From your facility's basement to your kitchen's stove top, here are the ten places to check for cockroaches:

## ☐ CARDBOARD AND PAPER STACKS

What's black, white and read all over? Cockroaches making newspapers their home. Call them news junkies, but these pests have a penchant for paper, envelope glue and cardboard. Maybe it's time to switch to the e-subscription.

## ☐ APPLIANCES AND EQUIPMENT

Cockroaches may settle around appliances and equipment, from the communal office refrigerator to the commercial chiller. And why not? Their running motors provide warm refuge, and there are bound to be crumbs nearby.

## ☐ RESTROOMS

Sure, they have water; but what about the food? Believe it or not, cockroaches are a fan of grooming products, discarded paper tissues and even shed skin or hair.<sup>38</sup>

## ☐ CABINETS

From hospital drawers to executives' desks, cockroaches are known to enjoy the solitude and warmth of a well-worn piece of furniture. Check behind the hinges.

## ☐ KITCHENS

Cockroaches are saavy scavengers that readily consume any organic food source, whether in an office breakroom or in a food manufacturing facility kitchen.

## ☐ STORAGE AREAS

Storage areas tend to be dark, crowded and moist, making them cockroaches' dream home.

## ☐ CEILINGS

Think you've avoided a cockroach infestation? Look up. Ceilings are a long-time favorite hangout for these pests. Pun intended.

## ☐ WALL DÉCOR

While paintings and picture frames may add flair to a doctor's waiting room or a hotel lobby, they also serve as a favorite cockroach hideaway.

## ☐ PIPES

For cockroaches, hiding in plumbing is anything but a pipe dream. These pests enjoy the humidity and warmth of exposed pipes underneath sinks, in basements or along warehouse ceilings.

# CONTROLLING THE UNCONTROLLABLE

They're the triple threat: quick to reproduce, virtually impossible to locate and difficult to kill. This means that sighting a single scurrying roach could signal a much larger infestation – one that requires the help of a pest management professional.

There are five critical steps in waging the war against cockroaches:



## 1. PREVENTION

Speaking of triple threats, your business offers one to cockroaches: food, water and shelter. To help prevent these pests' entry:

- ✓ Make sure your building is in good physical condition. Cracks and crevices are like "vacancy" signs to cockroaches.
- ✓ Consider door sweeps and weather stripping to help ensure entrances are protected.
- ✓ Screen or cap unused floor drains to help prevent roaches from climbing up.
- ✓ Inspect all incoming items for cockroaches and their egg cases.



## 2. SANITATION

Cockroaches don't discriminate between roach motels and 5-star resorts. That said, the presence of clutter, food debris and trash may increase the odds of an infestation. Take the following steps:

- ✓ Continuously clean up food debris and scraps, all of which are delicacies for cockroaches.
- ✓ Empty trash frequently and clean areas by dumpsters.
- ✓ Sweep and mop regularly, paying particular attention to areas under machines, by appliances or around furniture. **Bonus: this clean-up will also remove any cockroach debris that triggers allergies.**



## 3. INSPECTION

The key to successful cockroach control is inspection. Using a flushing agent (a spray used to "flush" pests out of hiding) and flashlight, a pest management professional will be able to help you determine:

- ✓ **Where your facility is vulnerable to cockroach infestations** – or where the infestation is already occurring. Knowing the source of the problem will lead to more effective implementation.
- ✓ **Which cockroach species are inside your facility.** Different species require different solutions, so it makes a difference whether an American or a German roach had their passport stamped at your building's borders.
- ✓ **What implementation solution will be most effective.** Your solution will be as unique as your facility, and there's no one-size-fits-all when it comes to controlling cockroaches.



## 4. IMPLEMENTATION

Cockroaches can survive nuclear radiation – you think they can't survive a little bit of Raid? Many over-the-counter products for cockroach removal will prove ineffective and can potentially lead to even larger infestations. Your pest management provider will choose from a variety of cockroach control solutions, including:

- ✓ **Residual baits:** For the cracks/crevices where cockroaches may be residing
- ✓ **Glue traps:** For the areas where cockroaches may be traveling
- ✓ **Insect Growth Regulators:** For inhibiting cockroaches' molting
- ✓ **ULV mist:** For a large-scale fog to cover the entire facility; rarely implemented and only administered by experienced providers.



## 5. LONG-TERM INTERVENTION

Cockroaches have over 400 million years of survival tactics on their side; they may live to see another day in your commercial facility. To help prevent the great roach revival, a pest management provider should continue to monitor your facility for vulnerable entry points or new pest activity.<sup>39</sup>

They've outlived dinosaurs, outrun cheetahs and outnumbered humans – but they haven't outsmarted The Orkin Man®. In The Cockroach Chronicles, the World's Most Resilient Pest has finally met its match.

We've learned how these creepy creatures can scuttle into facilities, wreak havoc on health and rattle reputation. But there's no need to lose sleep over these pests – even if they're dashing across your ceiling.

From food manufacturing to healthcare facilities, The Cockroach Chronicles addresses and answers your most pressing cockroach questions.

**DISCOVER MORE FILTHY PESTS AT  
[WWW.ORKINCANADA.CA](http://WWW.ORKINCANADA.CA)**



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