Pollinating *Arisaema*

The field guide
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Every other card in this set assumes one plant running two phases. **This genus splits the phases between plants:** a small *Arisaema* flowers male, a large one female, and it re-decides every spring. So the cross needs **two plants of opposite sex, open together** — and the sex is read in one glance, off a hole at the base of the spathe. In exchange the genus is generous with time: the flower stands **about three weeks**, not one hot evening. The hard part is not technique. It is holding two plants that agree.

THE SEASON — MEASURED ONCE, IN QUEBEC

~20 DAYS	How long one inflorescence stays open — 19.7 on average in **both** sexes, up to 26. Against **2–5 days** in *Arum* and *Dracunculus*, this is the family's slowest flower. [2]
13–16 DAYS	How long the stigmas appear to stay receptive — judged by eye from the stigma surface changing, **not measured**. Treat the first week as the real window. [2]
~8 DAYS	The pollen-release window on the male. **67% of all insect traffic** arrived inside it — 8.6 insects a day, collapsing to 3.4 the day it ended. [2]
AFTER	Berries sit green through the season and colour late. A fruiting head on a woodland herb this size is a heavy spend — see the corm note below.

THREE NUMBERS

1–2 mm — The exit hole at the base of a **male** spathe tube, recorded across two dozen species in six sections. The female never grows one. [8,1] This hole is your sexing tool — see the checks opposite.

133 — Insects found in **6,983** inflorescence checks across a whole wild season — well under one per flower per day. [2] Natural visits are astonishingly rare. That is why this card exists.

~25 yr — The sourced lifespan of *A. triphyllum* — a couple of dozen breeding attempts, not the "100 years" that circulates uncited. [1]

THE CORM DECIDES THE SEX

01 **Small corm means male; large corm means female.** The plant reads its reserves each spring and flowers whichever it can afford — pollen is cheap, fruit is expensive. [7]

02 **The switch runs both ways.** Root-pruned females came back male; corms that recovered went back to female. Sex tracks resources, not age. [7]

03 **So feed the seed parent the year before**, and expect a plant that fruited heavily to come back male — or not flower — the next season. That is the system, not a failure.

Two plants bought separately may be one clone — the genus offsets freely. For a true cross, get your second plant from a different *collection*. And since either plant can change sex on you, three plants of staggered sizes is the stable setup.

SEXING THE PLANT — LOOK AT THE BASE OF THE SPATHE

Hole = male
Where the rolled spathe edges overlap, at the very bottom of the tube: a round gap 1–2 mm across, grown into the tissue, never closing. [8]

Sealed = female
Same overlap, pressed flat — the outer edge thickened and bearing down. Nothing to find. [8]

Check every year
Last year's female may be this year's male. *A. triphyllum* can even carry both sexes on one spadix. [2]

Monoecious species show the hole late. In *A. tortuosum* — both sexes on one spadix, female phase first — the exit stays shut through the whole female phase and gapes only when pollen release begins. [1] The door is tied to maleness, not to the calendar.

KIT

- Fine **brush**
- Scalpel or blade
- **Hand lens** — the hole is small
- Small dry tube for pollen
- Labels + dated notebook
- **Two plants**, opposite sexes, open together

THE CROSS

01 **Confirm the sexes off the spathe base** — hole on the pollen parent, sealed on the seed parent. Do not go by size alone.

02 **Wait for the male to shed.** The pollen piles up at the foot of the tube, in the bare ring of spadix just above the exit hole — the plant stacks its pollen on top of its own door. [1]

03 **Harvest low.** Open the front of the male tube at the base, or tap pollen out through the cut, into a dry tube. A male that has shed has done its work.

04 **Open a small window low in the female tube.** The stigmas line the bottom chamber — the same place the trap presses its victims. [1] Cut only what the brush needs.

05 **Brush every stigma you can reach.** Then, unlike every fast-flowering aroid on these cards, **come back and repeat** on another day — the receptive window runs into a second week. [2]

06 **Label it** — date, seed parent, pollen parent — and leave the spathe to wither on its own schedule.

Expect dead fungus gnats in a female tube. The female trap has no exit; corpses inside are the system working, not a pest problem, and not your failure. [1]

One species needs none of this. *Arisaema flavum* is fused shut, self-fertile, and set fruit as a single isolated plant — the one *Arisaema* where one specimen is enough. [1]

WHAT THE BOOKS GET WRONG — AND WHAT IT CHANGES AT THE BENCH

"IT RUNS WARM"	**It does not heat. At all.** The only measurement ever made — six plants, probes logged every ten minutes for three weeks, every inflorescence shaded — found no significant warming in either sex; daytime blips of 0.25–0.57 °C vanished against the plant's own petiole.[2] **Do not touch-test and do not wait for warmth** — that trick belongs to *Arum*.
"SMELL TELLS YOU IT'S READY"	Most *Arisaema* scents are **nearly imperceptible to humans** — a spathe you cannot smell is not a spathe that is off. Genuine mushroom mimicry is the exception (*A. sikokianum*), not the genus.[3] Go by the anthers and the stigmas, not your nose.
"A TRAP LIKE ARUM'S"	*Arum* detains overnight and releases through the entrance. *Arisaema* has **no moving parts** — no bristles, no valve, a wax wall that cannot be switched off. Males release through the grown basal hole; females never release at all.[1] Nothing you do to the spathe "opens" it.
"IT IS DIOECIOUS"	It is **paradioecious** — sexes on separate plants at any one moment, but each plant moves between them with its resources, in both directions, experimentally proven a century ago.[7] Plan your breeding stock around plants that will not hold still.
"NO VISITS = NO POLLINATORS"	133 insects in 6,983 checks is what a **healthy** wild population looks like.[2] The species once written off as attracting nothing at all — *A. serratum* — later produced 2,459 recorded visits in 64 hours.[1,9] Rarity is the baseline, not a diagnosis.
"THE GNATS ARE JUST VICTIMS"	In at least two Japanese species the trap is also a **nursery**: larvae rear inside without harming the ovules, and in *A. urashima* the pollinator routinely climbs back out of female spathes alive.[5,6] A spathe full of insect life is not necessarily a spathe full of the dead.

> **Do not tidy the inflorescence.** The one floral manipulation ever run in this genus — cutting the thread-like tip off the appendix of *A. urashima* — cut pollinator visits, dropped fruit set from **79 to 42 per cent** and seed set from **37 to 11 per cent**.[4] Whatever dangles from your plant's spathe or spadix is working. Leave it.

SOURCES [1] Vogel & Martens 2000, *Bot. J. Linn. Soc.* 133: 61–100 · [2] Barriault et al. 2009, *Botany* 87: 324–329 · [3] Suetsugu 2022, *Plants People Planet* 4: 196–200 · [4] Suetsugu et al. 2022, *Ecology* 103: e3782 · [5] Suetsugu et al. 2024, *Plants People Planet* 6: 536–543 · [6] Suetsugu et al. 2024, *Plant Biol.* 26: 1–8 · [7] Schaffner 1922, *Am. J. Bot.* 9(2): 72–78 · [8] Barnes 1935, *J. Bombay Nat. Hist. Soc.* 37(3): 630–639 · [9] Nishigaki et al. 2025, *J. Plant Res.* — Every figure is scoped to the species it was measured in; where a result rests on one population or one season, the guide page says so.