PAPER CHECK · MAGNETIC FIELDS AND AGING

Does removing Earth's magnetic field change how fruit flies age?

A team led by the University of Nottingham kept healthy fruit flies and a Parkinson's-model strain inside a magnetic shield for 50 to 60 days [1 pp. 1316–1317, 1319]. The paper's abstract reports 20% longer lives in the Parkinson's model and calls low-field exposure a potential non-invasive approach to neurodegenerative disease [1 p. 1316]. We checked six of its claims against its own statistics, keeping what the paper reports separate from our assessment.

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OUR ANALYSIS marks our own reasoning, and the verdicts are our assessment. Everything else comes from the numbered sources; for the paper [1], p. gives the journal's page number and Fig. a figure or one of its panels.

An interesting exploratory study, not evidence for a treatment

OUR ASSESSMENT

0.50
Hazard ratio for Pink1 flies moved into the shield at day 20: a significantly lower risk of death than controls (p = 0.003) [1 Fig. 1F]

0.80
for Pink1 flies moved in at day 10, which spent longer in the shield: not significant (p = 0.284) [1 Fig. 1F]

40–60
flies per group, all male, in one shield with no sham enclosure [1 pp. 1317–1318]

THE PAPER'S CLAIMS

PARTLY TRUE
Shielding increased the lifespan of Pink1 flies by 20%
The paper's abstract [1 p. 1316]

Pink1 flies moved into the shield at day 20 survived significantly better than controls (hazard ratio 0.50, p = 0.003), but flies moved in at day 10, which spent longer in the shield, did not (0.80, p = 0.284) [1 Fig. 1F]. The paper doesn't say how it calculated the 20% [1 p. 1316]. See section 2.

OVERSTATED
Wild-type flies lived shorter lives in the shield
The abstract and discussion [1 pp. 1316, 1324]

The paper's own tests found no significant change (hazard ratios 1.42 and 1.38; p = 0.225 and 0.273), and its results section says lifespan was not significantly altered [1 Fig. 1E][1 p. 1319]. The risk leaned higher, as it also did in the authors' short pilot study, whose groups were not age-matched [1 Suppl. Fig. 1]. But approximate 95% intervals of about 0.8–2.5 fit no effect as well as a large one. See section 2.

TRUE
Shielding improved wild-type climbing and worsened Pink1 climbing
The abstract and results [1 p. 1316, 1321]

In this one-shield experiment, wild-type flies climbed better at days 20, 35 and 40 and Pink1 flies worse at days 20–35, with significant age-by-treatment interactions in both (p = 0.0026 and 0.0013) [1 Fig. 2]. The controls' own scores swung widely between tests, so some single-day differences may reflect test-day noise [1 Fig. 2]. There was no sham enclosure, so what was tested is the shield as a whole, not necessarily the low field; blinding isn't reported. See section 3.

PARTLY TRUE
Shielding increased mitochondrial complex II activity
The paper's abstract [1 p. 1316]

Complex II-linked respiration was higher in shielded wild-type flies (p = 0.027, 4 chambers of 3 flies per group) and in a small supplementary test of wild-type flies shielded from day 20 (p = 0.050, 3 per group), where it rose because complex I respiration fell [1 Fig. 3C][1 Suppl. Fig. 3]. In Pink1 flies it was not significantly higher (p = 0.275) [1 Fig. 3D]. See section 2.

OVERSTATED
Shielding raised superoxide levels
The paper's abstract [1 p. 1316]

The diamond sensors' free-radical signal did rise (overall treatment effect p = 0.0015) [1 p. 1319]. But the probe, TEMPOL, isn't specific to superoxide: it also reacts with other radicals, and cellular reductants such as ascorbate, and mitochondria, turn it into the same non-magnetic form that the sensors count as scavenged radicals [1 p. 1318][9 §1.2, §2][10]. A change in the signal is shown; a rise in superoxide is not. See section 3.

OVERSTATED
Low-field exposure is a potential non-invasive approach for neurodegeneration
The abstract and discussion [1 p. 1316, 1325]

"Potential" hedges the claim, but the basis is one study in male flies, with no sham enclosure, no mitochondrial measurements in the group that lived longer and no tests in mammals [1 p. 1317–1319]. The same treatment worsened the disease-related climbing deficit in Pink1 flies, as the authors note [1 p. 1321]. See section 4.

1 · THE EXPERIMENT

Flies spent 50 to 60 days in a field thousands of times weaker than Earth's

Two groups of flies were moved into a magnetic shield 10 or 20 days after emerging as adults and stayed there; controls stayed in Earth's field. Survival was followed to day 70 [1 pp. 1317, 1319].

The flies
Only male flies were used, because the Pink1 mutation is on the X chromosome. Control flies of the laboratory strain w^{1118}, which the paper calls wild type, were compared with $Pink1^{B9}$ mutants [1 p. 1317].

Losing Pink1 gives flies features of early-onset Parkinson's disease: faulty mitochondria, poor climbing, loss of dopamine neurons and shorter lives [1 p. 1317][4].

The shield and its field
The flies were kept in a passive MuMetal benchtop shield (Magnetic Shields Ltd, model GA4); the paper points to a published description of the shield's design [1 pp. 1316–1317][3].

The field inside, measured before and after the experiment, averaged 5.6 nT, give or take 0.3 nT; the paper doesn't say what the margin represents [1 p. 1317]. The abstract rounds this to 5 nT [1 p. 1316]. The shield's lid was opened to take flies out, change their food (every 2–3 days) and run tests [1 pp. 1317–1318].

Who went into the shield, and when

Days since the flies emerged as adults; survival was followed to day 70

Entry days and the length of the survival study: Reed et al. (2026), CC BY 4.0 [1 pp. 1317, 1319]. Climbing was tested every 5 days; the paper's results cover days 15 to 45, or 25 to 45 for the group shielded from day 20 [1 p. 1319][1 Fig. 2]. The authors say the Pink1 flies' symptoms typically begin about 30 days after they emerge; they give no source for this [1 p. 1317].

How weak is 5.6 nT?

Logarithmic scale: each labeled step is ten times stronger than the one before

The shield's field and the paper's hypomagnetic threshold: Reed et al. (2026), CC BY 4.0 [1 pp. 1316–1317]. Earth's surface field: the World Magnetic Model report [2 Table 1].

INSIDE THE SHIELD
5.6 nT
give or take 0.3 nT, measured before and after the experiment [1 p. 1317]

AT EARTH'S SURFACE
23–67 μT
the field's approximate range around the globe [2 Table 1]. The paper gives 25–60 μT [1 p. 1316].

EARTH'S FIELD IS STRONGER BY
OUR ANALYSIS
4,000–12,000×
roughly: 23,000 nT ÷ 5.6 nT ≈ 4,100; 67,000 nT ÷ 5.6 nT ≈ 12,000. Each time the lid was opened, the flies were briefly exposed to a stronger field.

How many flies, and how they were tested

SURVIVAL
40–60
flies per group, 20 per vial, checked every 2–3 days to day 70 [1 pp. 1318–1319]

CLIMBING
4–5
replicate tests per group at each age, 20 flies to a vial, every 5 days from day 15 to day 45. The paper doesn't make clear whether these were separate vials or repeat tests of the same flies; its Figure 2 legend says "20 individuals were used per group" [1 p. 1318][1 Fig. 2].

MITOCHONDRIAL RESPIRATION
4
chambers per group, each with 3 pooled flies, from the groups shielded from day 10 [1 p. 1319]. A supplementary figure adds wild-type flies shielded from day 20, measured at day 72 (3 per group) [1 Suppl. Fig. 3].

FREE RADICALS
5
replicates per group, read with diamond quantum sensors (nitrogen-vacancy centers in nanodiamonds) and the spin probe TEMPOL [1 p. 1318][1 Fig. 3]. The method was recently described in a preprint by the same group [8].

2 · WHAT THEY FOUND

The shield's effects ran in opposite directions in healthy and Pink1 flies

Shielded wild-type flies climbed better and showed a non-significant trend toward shorter lives. Shielded Pink1 flies climbed worse, and those shielded from day 20 lived longer [1 Figs. 1–2].

Shielded flies compared with controls kept in Earth's field

Significant change, with its direction · No significant change

	WILD-TYPE FLIES	PINK1 MUTANT FLIES
Survival	**No significant change** Hazard ratios 1.42 and 1.38; p = 0.225 and 0.273 [1 Fig. 1E]	**Longer, day-20 group only** Hazard ratio 0.50, p = 0.003; for the day-10 group, 0.80, p = 0.284 [1 Fig. 1F]
Climbing	**Better** At days 20, 35 and 40 in Figure 2A; the results text says days 20, 30 and 40 [1 Fig. 2A][1 p. 1321]	**Worse** At days 20 to 35 in Figure 2B; the results text also lists day 40, where the figure shows no significant difference [1 Fig. 2B][1 p. 1321]
Complex II respiration	**Higher** p = 0.027, 4 chambers per group [1 Fig. 3C]	**No significant change** p = 0.275, although combined complex I and II respiration was higher (p = 0.035) [1 Fig. 3B, 3D]
Free-radical signal	**Higher during active respiration** p = 0.025; not significantly at rest (p = 0.069) [1 Fig. 3E]	**Higher at rest and during active respiration** p = 0.026 and 0.037, with a smaller rise between the two (group means only; no test reported) [1 Fig. 3E–F]

Climbing was analyzed with mixed models that allow for repeated tests of the same vials. The age-by-treatment interaction was significant in both genotypes: wild-type F(10,61) = 3.16, p = 0.0026; Pink1 F(10,61) = 3.44, p = 0.0013 [1 p. 1319][1 Fig. 2]. Complex I-linked respiration did not differ significantly in either genotype (p = 0.694 and 0.378) [1 Fig. 3C–D]. "At rest" is the paper's routine respiration and "active respiration" its combined complex I and II OXPHOS state [1 Fig. 3E].

Survival

Risk of death, shielded flies vs. controls
The shield's effect on survival differed between the genotypes (likelihood-ratio χ^2 = 8.13, df = 2, p = 0.017) [1 Fig. 1]. A hazard ratio below 1 means a lower risk of death than in the controls.

Data: Reed et al. (2026), Fig. 1E–F, CC BY 4.0 [1 Fig. 1E–F]; intervals approximated by Fact-Checked Science. The paper draws this chart on a linear scale.

OUR ANALYSIS
The dashed whiskers are approximate 95% intervals we back-calculated from each hazard ratio and p-value: wild-type day 10, 0.81–2.50; wild-type day 20, 0.78–2.45; Pink1 day 10, 0.53–1.20; Pink1 day 20, 0.32–0.79. The paper shows the exact intervals only as a chart, and ours match it to within about 0.02 [1 Fig. 1E–F].

Where the 20% comes from
The abstract calls this a 20% lifespan increase in Pink1 flies [1 p. 1316], and the university's news release says "around 20%" [16], but the paper doesn't say how the figure was calculated.

PINK1 CONTROLS
OUR ANALYSIS
≈44 days
median survival, read from the paper's survival curves [1 Fig. 1B]

PINK1, SHIELDED FROM DAY 10
OUR ANALYSIS
≈47 days
about 7% longer than the controls [1 Fig. 1B]

PINK1, SHIELDED FROM DAY 20
OUR ANALYSIS
≈54 days
roughly 20–25% longer than the controls [1 Fig. 1B]

How the authors explain it

A stress response in complex II
Shielding raised complex II-linked respiration in wild-type flies and raised the free-radical signal in both genotypes [1 Fig. 3C, 3E]. The authors read the complex II rise as a response to the stress of the low field and compare it with low oxygen [1 p. 1324].

In healthy flies, they suggest, the extra complex II activity places unnecessary demands on mitochondria and shortens life [1 p. 1324], although their own survival analysis found no significant change in wild-type lifespan [1 Fig. 1E]. In Pink1 flies, whose complex I works poorly, extra complex II activity could compensate, they propose [1 p. 1324].

They also propose that free radicals act as signals that switch on protective pathways [1 p. 1324], and they describe the pairing of longer life with worse climbing in Pink1 flies as paradoxical [1 p. 1316].

OUR ANALYSIS
The low-oxygen comparison is thinly sourced
The study the authors cite for this found that complex II supplies heart cells' reserve respiratory capacity and that activating it with drugs helped the cells survive low oxygen, but that low oxygen itself used up that reserve rather than raising it [11].

A second study, which they cite for oxygen's ability to "activate or inactivate" complex II, found that severe low oxygen reduced complex II respiration in human blood cells [1 p. 1324][12].

3 · HEADLINE CLAIMS

One claim holds, two hold in part, and three go beyond the paper's own statistics

Headline claims, checked against the paper's own numbers. The left and middle columns come from the paper; the verdicts on the right are our assessment.

In the authors' words
HMF is the paper's abbreviation for the hypomagnetic field inside the shield. GMF for Earth's geomagnetic field and WT for wild-type; 10D and 20D are the groups shielded from day 10 and day 20.

"HMF exposure increased lifespan in Pink1−/− D. melanogaster by 20%, with a paradoxical reduction in climbing ability. WT D. melanogaster had decreased lifespan and improved locomotor performance under HMF."
The abstract [1 p. 1316]

"HMF exposure did not significantly alter overall lifespan compared to the same genotype in GMF (Figure 1A)."
The results [1 p. 1319]

"In WT flies, neither 10D HMF (HR=1.42, p=0.225) nor 20D HMF (HR=1.38, p=0.273) significantly altered mortality risk. In Pink1−/− flies, 20D HMF significantly reduced mortality risk relative to GMF (HR=0.50, p=0.003), while 10D HMF did not (HR=0.80, p=0.284)."
The Figure 1 legend [1 p. 1320]

THE PAPER SAYS (PARAPHRASED)	WHAT THE PAPER'S STATISTICS SHOW	OUR VERDICT
The shield increased Pink1 lifespan by 20%.	Significant for flies shielded from day 20 (HR 0.50, p = 0.003), not for flies shielded from day 10 (HR 0.80, p = 0.284) [1 Fig. 1F]. The 20% appears only in the abstract, with no method given [1 p. 1316].	PARTLY TRUE — Holds for one of the two shielded groups, and the number is unexplained.
Wild-type flies had shorter lives in the shield.	Neither shielded group differed significantly (HR 1.42, p = 0.225; HR 1.38, p = 0.273) [1 Fig. 1E], and the results section says lifespan was not significantly altered [1 p. 1319]. The abstract and discussion say it decreased [1 pp. 1316, 1324]. The hazard ratios lean toward higher risk, as did the authors' short pilot study, whose groups were not age-matched [1 Suppl. Fig. 1].	OVERSTATED — The abstract and the results disagree; the data fit no effect as well as a large one.
The shield improved wild-type climbing and worsened Pink1 climbing.	Significant at several ages in both genotypes (wild-type days 20, 35 and 40; Pink1 days 20 to 35), in mixed models that allow for repeated tests of the same vials [1 Fig. 2]. The controls' own scores swung widely between tests (Pink1 controls about 53%, 95% and 56% at days 25, 30 and 35), so some single-day differences may reflect test-day noise [1 Fig. 2]. There was no sham enclosure, and blinding is not reported.	TRUE — In this one-shield experiment.
The shield increased mitochondrial complex II activity.	Significant in wild-type flies (p = 0.027, 4 chambers per group; p = 0.050 in a supplementary comparison with 3 per group), not significant in Pink1 flies (p = 0.275) [1 Fig. 3C–D][1 Suppl. Fig. 3]. In the supplementary comparison, combined complex I and II respiration was about the same in both groups (about 60 and 57), and the complex II value rose because complex I respiration fell (from about 48 to 33) [1 Suppl. Fig. 3]. In the main wild-type comparison, combined respiration did not differ significantly (p = 0.089) [1 p. 1321].	PARTLY TRUE — Wild-type flies only, on small samples.
The shield raised superoxide levels.	The free-radical signal rose under the shield (overall treatment effect p = 0.0015); the pairwise tests were not adjusted for multiple comparisons [1 p. 1319]. TEMPOL is not specific to superoxide. It also reacts with other radicals, such as hydroxyl, and inside cells it is reduced to a non-magnetic form, both in mitochondria and by reductants such as ascorbate; the sensors read that change the same way as scavenged radicals [1 p. 1318][9 §1.2, §2][10].	OVERSTATED — A change in the signal is shown; a rise in superoxide is not.
Low-field exposure is a potential non-invasive approach for neurodegeneration.	One study, in male flies only. The paper itself notes that shielding worsened the disease-related climbing deficit in Pink1 flies [1 p. 1321].	OVERSTATED — "Potential" hedges it, but it still reaches well beyond the evidence.

How we rated
We rated each claim against the paper's own statistics, on our standard scale. Because there was no sham enclosure, we rate each claim as a claim about the shield; the paper attributes the effects to the low field itself.

- TRUE — The evidence supports the claim; here, for this one experiment.
- PARTLY TRUE — Part of the claim holds up and part doesn't, for example for one group but not another.
- OVERSTATED — Has some basis but claims much more than the evidence supports.

4 · STRENGTHS AND LIMITATIONS

Careful statistics in places, but one shield, small groups and no sham control

Our assessment of the study's design, including what its three supplementary figures add [1 pp. 1329–1330].

OUR ANALYSIS

Strengths
- **A disease model.** The authors note that earlier long-term low-field studies mostly used healthy organisms or cell lines [1 pp. 1316–1317].
- **A direct test between genotypes.** For survival, the paper tests directly whether the shield's effect differs between genotypes, instead of comparing p-values across groups [1 p. 1319]. Climbing and respiration were analyzed one genotype at a time.
- **Suitable statistics.** Mixed models for the repeated climbing tests, and corrections for multiple testing in the pairwise survival and climbing comparisons (Holm and Tukey methods) [1 p. 1319].
- **The field was measured** inside the shield before and after the experiment, though with a Hall probe of unstated make; the paper doesn't say whether the shield was degaussed after the lid was opened, as its design paper does after every opening [1 pp. 1317–1318][3].
- **Two kinds of measurement.** Standard high-resolution respirometry, paired with a new diamond-sensor method for free radicals. The method has so far been described only in the group's own preprint [1 p. 1318][8].
- **Null results reported plainly** in the results section, and the paper is open access [1 pp. 1319, 1321].

Limitations
- **One shield, no sham enclosure.** Shielded flies were compared with flies kept outside it. The box may differ from the bench in microclimate, mains-frequency fields or handling; the authors say light, noise and temperature were matched [1 p. 1318].
- **Small groups.** 40–60 flies per treatment, housed 20 to a vial, so two or three vials [1 p. 1318]. The survival tests treat every fly as independent and include no term for the shared vial [1 p. 1319].
- **Unclear climbing replicates.** If the 4–5 replicates were repeat tests of the same 20 flies, the climbing statistics overstate the number of independent samples [1 p. 1318][1 Fig. 2].
- **An assumption not met.** The test showing that the shield's effect on survival differed between genotypes uses a combined model. The paper's own diagnostic shows that the genotype hazard ratio in that model changes over time (p < 0.001), so one assumption behind the test is not met [1 Fig. 1][1 Suppl. Fig. 2A].
- **No dose–response.** Flies shielded from day 10 spent about 10 more days in the low field than flies shielded from day 20, but showed no significant benefit [1 Fig. 1F]. The supplement's "dose-response" model scores the groups as 0, 10 and 20 days of exposure, but those numbers are the day the flies entered the shield, not the time they spent in it [1 Suppl. Fig. 2C][1 p. 1317]. The authors also suggest that the timing of exposure matters [1 p. 1321]; the supplement nonetheless treats the groups as a duration series.
- **Mitochondria not measured in the flies that lived longer.** Respiration was measured in flies shielded from day 10, and the free-radical tests used the same samples [1 pp. 1319, 1324]. The only day-20 measurements are a small supplementary set in wild-type flies (3 per group) [1 Suppl. Fig. 3].
- **No blinding reported, no public data.** The paper says its data are in the article and supplement, with more available from the corresponding author on reasonable request. No raw data are deposited in a public repository [1 p. 1325].
- **Only males were tested** [1 p. 1317].
- **Editing slips.** The field probe's make is left as "(Brand)" [1 p. 1317]. The climbing line is 5 cm in the methods [1 p. 1318] but 10 cm in the Figure 2 legend [1 p. 1322]. The Figure 1 legend says the Pink1 group shielded from day 10 differed significantly from controls, but the figure itself and the text show it was the group shielded from day 20 [1 p. 1320–1321]. And the results text lists climbing differences on days its own figure doesn't mark: day 30 for wild-type flies and day 40 for Pink1 flies [1 p. 1321][1 Fig. 2]. The abstract also names the control strain "W1118" instead of w1118 [1 pp. 1316–1317].

5 · READING THE RESULTS WITH CARE

Without a sham shield, the low field and the box itself can't be told apart

Shielded flies were compared with flies kept outside the shield, not with flies in an identical box that restored Earth's field [1 p. 1318]. And a much larger, blinded study of brief exposures, which the paper cites only in passing, found no magnetic effect on fly climbing [5].

OUR ANALYSIS
Another explanation to test
Without a sham enclosure, the box itself, not only the low field, could have changed the flies' activity or metabolism, and that could affect both climbing and survival. Because activity does not reliably predict lifespan in fruit flies, this is a possibility, not a likely mechanism. The paper does not test it.

A simple trade-off between activity and lifespan is not established in fruit flies. Studies that tracked individual flies found that the less active ones were not the longer-lived [13][14], and a study of inbred fly lines found that metabolic rate did not predict lifespan [15].

A large, blinded study found no magnetic effect on fly climbing
The authors cite a large 2023 study [5] and a published comment disputing it [6], but only to say that other researchers "have considered whether MFs [magnetic fields] can influence D. melanogaster" [1 p. 1325].

The 2023 study, blinded and with sham controls, tested climbing in 10,960 flies and found no magnetic effect, including in a near-zero field; its authors stood by that finding in a reply [5][7]. Those flies were exposed for minutes, not weeks, so the study does not rule out the effects reported here.

> *"Under meticulously controlled conditions and with vast sample sizes, we have been unable to find evidence for magnetically sensitive behaviour in Drosophila."*
> Bassetto et al. (2023) [5 Abstract]

Where our assessment could be wrong

We worked from the published figures
We read the full text and the three supplementary figures: a short pilot survival study whose groups were not age-matched [1 Suppl. Fig. 1], model checks, aging-rate estimates and a "dose-response" model [1 Suppl. Fig. 2], and a small respiration test of wild-type flies shielded from day 20 [1 Suppl. Fig. 3]. No raw data are public, so our median survival times are readings of the paper's figures, not a re-analysis.

Our intervals are approximate
The whiskers on the survival chart are our approximation, not the paper's, although they match the paper's chart to within about 0.02 [1 Fig. 1E–F].

The shield may be better controlled than described
The enclosure may be better matched to the controls' conditions than the methods describe [1 p. 1318].

Our starting point
We came to this paper while checking claims about magnetic-field catastrophes, which could prime us toward skepticism. To limit that, we rated each claim against the paper's own statistics.

What would settle it
01 A sham shield: the same box with coils restoring Earth's field.
02 Blinded scoring of climbing and deaths.
03 Several independent cohorts of a few hundred flies each.
04 Respiration and free radicals measured in the Pink1 flies shielded from day 20, with the normalization clearly stated; the methods and Figure 3 give different units [1 pp. 1318, 1323].
05 Both sexes.
06 Raw data shared openly.

These are our suggestions; the 2023 study shows what sham exposures with blinded experimenters look like [5]. A replication along these lines that again found longer survival in shielded Pink1 flies, with mitochondrial changes measured in the same flies, would firm up the lifespan and complex II claims. One that found no difference would weaken them.

6 · CONCLUSIONS

A lead worth replicating

The authors conclude
Hypomagnetic fields change mitochondrial physiology and free-radical production in fruit flies, with effects that depend on genotype: detrimental in healthy flies but life-extending in the Pink1 model. Low-field exposure, they suggest, could become a non-invasive, mitochondria-targeted approach for neurodegenerative disease [1 pp. 1316, 1325].

OUR ANALYSIS
Our conclusion
An interesting exploratory study that raises a fair question. Its strongest result, longer survival in Pink1 flies moved into the shield at day 20, rests on one shield, 40–60 flies per group and no sham control, and it came with worse climbing [1 p. 1318][1 Figs. 1–2]. Treat it as a lead worth replicating, not as evidence for a treatment or for Earth's field shaping human aging.

Prepared by Fact-Checked Science from the open-access text and figures of Reed et al. (2026), *Aging* 18, 1316–1330. doi:10.18632/aging.206424, CC BY 4.0 [1]. The charts are redrawn from the paper's reported numbers; the survival intervals are our approximation. The assessment is our own and has not been reviewed by the authors.

Sources

Bracketed numbers refer to this list. For the paper [1], p. and pp. are the journal's page numbers (1316–1330), Fig. a figure or panel and Suppl. Fig. one of its three supplementary figures. Table 1 is in [2], and § marks a section of [9]. Links checked October 12, 2026.

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METHOD

How this was checked

On October 12, 2026, we checked every statement, number, quotation and citation on this page against its source: the full paper and its three supplementary figures, its Figures 1–3 read directly from the images, and the 15 other sources listed here, about 77 items in all. Every hazard ratio and p-value held up, and so did the sample sizes as the paper states them, though the paper is unclear about its climbing replicates. The check changed the climbing days, which now follow the paper's Figure 2 rather than its text; the first climbing results on the timeline (day 15, not day 5); and Earth's surface field, which is about 23–67 μT in the World Magnetic Model report rather than 25–60 μT [1 Fig. 2][2 Table 1]. It also removed a statement that less active fruit flies tend to live longer, which studies of fly activity and metabolic rate contradict [13][14][15], and added what the supplementary figures show. A fresh reviewer then read the built page against the sources. That check corrected how we described the TEMPOL probe and the climbing replicates, made our account of the authors' low-oxygen sources fairer, and added caveats to the climbing and complex II results. The change log lists every change.

The verdicts and the items tagged "Our analysis" are our own assessment, built on the cited sources. They include the approximate survival intervals, the field ratios, the median survival times we read from the paper's Figure 1B, and our reading of how the paper's statistics bear on each claim.

No raw data are public, so we re-ran only the arithmetic, and every number reproduced. The intervals we back-calculated from each hazard ratio and p-value match the intervals the paper plots in its Figure 1E–F to within about 0.02, and the paper's χ^2 and F-test p-values come out as reported [1 Figs. 1–2]. Only the field ratio changed, with the new range for Earth's field.

This page was researched and written with Claude, an AI assistant made by Anthropic, and then re-checked against its sources in a separate verification pass.

The verdicts on this page
- OVERSTATED — Has some basis but claims much more than the evidence supports.
- PARTLY TRUE — Part of the claim holds up and part doesn't.
- TRUE — The evidence supports the claim.

All ten verdicts, and how we check

CORRECTIONS

Corrections and changes

If we get something wrong, we fix it and record the change below with the date. If a correction changes a verdict, the log says what the old verdict was.

Change log

Oct 12, 2026 — Published on factchecked.science after a full check against the sources. Changes from the infographic: the climbing results now follow the paper's Figure 2 (wild-type flies better at days 20, 35 and 40, not 20, 30 and 40; Pink1 flies worse at days 20–35, not 20–40), and the mismatch with the paper's text is listed as a fourth editing slip; the timeline's climbing results start at day 15, not day 5; Earth's surface field is about 23–67 μT (World Magnetic Model), not 25–60 μT, so roughly 4,000 to 12,000 times the shield's field rather than 4,500 to 10,700; the statement that lower activity often goes with a longer life in fruit flies, which studies of fly activity and metabolic rate contradict, is gone, and the alternative explanation is rewritten; the supplementary figures are now read, adding a small respiration test of wild-type flies shielded from day 20, a failed proportional-hazards check and how the "dose-response" model codes exposure; "day-10 group only" for respiration now applies to the main figures; the onset of Pink1 symptoms around day 30 is attributed to the authors, who give no source; free radicals in Pink1 flies rose at rest and during active respiration, not only at rest; groups are 40–60 flies, not about 50; the climbing tests are 4–5 replicate tests per group rather than 4–5 vials of 20 flies, since the paper doesn't make clear whether they were separate vials or repeat tests of the same flies, which is now also listed as a limitation; the TEMPOL caveat now explains that cellular reductants and mitochondria turn the probe into the same non-magnetic form that the sensors count as scavenged radicals; the climbing verdict notes the controls' swings between test days, and we say that each claim is rated as a claim about the shield; the field measurement listed as a strength now notes the unnamed probe and that degaussing isn't mentioned; the conclusion calls the paper an exploratory study rather than a pilot; and we added what the authors' low-oxygen sources found and the 2023 study that found no magnetic effect on fly climbing. Restated the verdicts on our standard scale: "Partly supported" is now Partly true (Pink1 lifespan); "Not supported as worded," Overstated (wild-type lifespan); "Supported," True (climbing); "Supported in wild-type only," Partly true (complex II); "Signal supported; superoxide not shown," Overstated (superoxide); "Speculative," Overstated (a non-invasive approach).

Sep 29, 2026 — Analysis compiled from the paper as published September 23, 2026.