Electronic Supplementary Materials (ESMs) for the paper:

Body size affects the evolution of hidden colour signals in moths

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Supplementary methods and results

Coloration categorisation by human observers

For this, we used the same photos of each species that we used for contrast measurements (see methods in main text), without any indication of body size from the photos. This process was done solely by Kang, C. who did not take part in the classification. Next, we presented the photos of each species to five volunteers under the same conditions using a LCD monitor (HP 2010i; HP, Palo Alto, CA, USA). The volunteers categorized both forewings and hindwings of each species as cryptic, conspicuous or uncertain. Based on this categorization, we classified the overall coloration of each species as either cryptic (figure 1d; forewings/hindwings: cryptic/cryptic), conspicuous (conspicuous/conspicuous and conspicuous/cryptic), contrasting (cryptic/conspicuous), or uncertain. We can call moths with cryptic forewings and conspicuous hindwings “contrasting” without ambiguity, because (not surprisingly) there were no moths classified with conspicuous forewings and cryptic hindwings. During the categorization, all volunteers were told to assume that the resting places of the moths (i.e. background coloration against which each species usually rests on) would be the common substrates in a forest such as tree trunks, leaves, or leaf-litter [1]. We note here that, by assuming these general backgrounds, all volunteers were biased toward classifying brown, mottled grey, or green moths as cryptic.

Although we acknowledge that the conspicuousness of an animal is dependent on the observer’s visual system and the colour of animal’s natural resting substrate [2], human judgment of coloration has been employed in many other systems to understand the evolution of animal colour signals [3,4], and is a practical strategy when direct measurements of coloration for a diverse array of species are challenging [3]. To reduce the subjectivity of categorization, we analysed only those data that were consistent among multiple observers who independently categorized the conspicuousness of each species.

Of the 249 species investigated, colour data was obtained for 229 species. Among the five volunteers’ judgments of coloration, at least three volunteers agreed upon the judgments in 94% of the species, four volunteers agreed in 74% of the species, and all volunteers agreed in 55% of the species.

We used the wingspan of each moth as an index of body size. Wingspan data were obtained from either field guides or online databases and available for 201 species (81% of total; Table S3). We used a mid-range value when wingspan information was provided as a range. We fitted the same statistical analysis (PGLS) as illustrated in main text.

Phylogenetic analysis results using human judgment of coloration

Of the 94% of species presented, 68% were classified as cryptic, 15% as conspicuous, 17% as contrasting, 0% as uncertain. When we re-classified these categories into whether each species has contrasting hindwings or not (cryptic/conspicuous *vs.* contrasting; the same classification as the image analysis in the main text), the classification by human judgment matched 91% with the classification by image analysis. We have included sample images of moth species in each category in figure S2. Phylogenetic generalized least squares (PGLS) assuming the Ornstein-Uhlenbeck (OU) evolutionary model provided a better fit than Brownian Motion (BM) models (ΔAIC = 4.5). Applying the OU model, we found a substantial phylogenetic signal (estimated Pagel's $\lambda = 0.90$) and an association between moth coloration and wingspan (figure S1). Specifically, the species with contrasting wings were larger than cryptic species ($z = 2.80$, $P_{adj} = 0.02$). We found no significant wingspan differences between cryptic and conspicuous species ($z = 1.10$, $P_{adj} = 0.27$) nor between conspicuous and contrasting species ($z = -1.26$, $P_{adj} = 0.27$). Although not presented, the results from four and full agreement consensus were qualitatively identical.

References for Supplementary methods

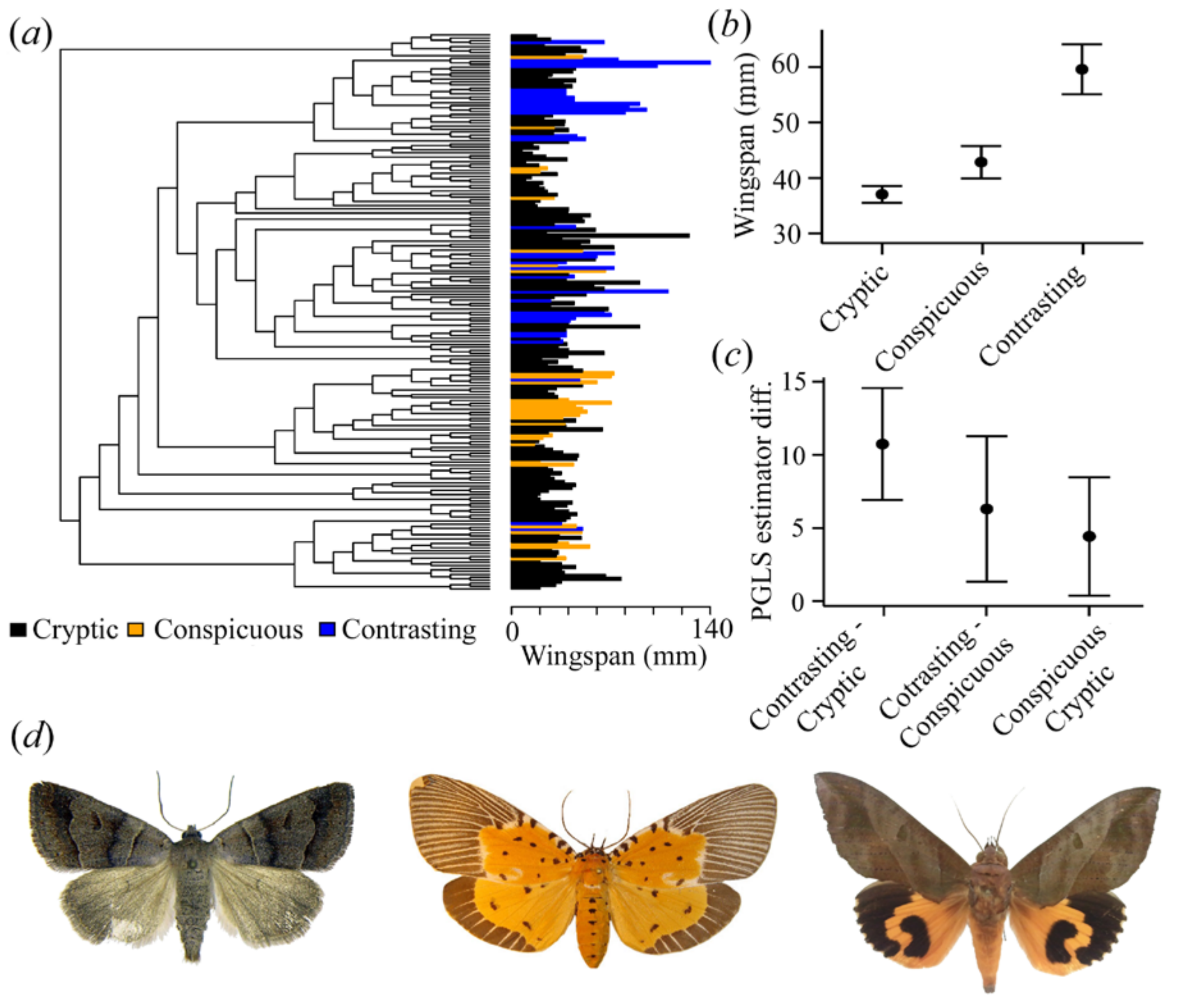
1. Endler JA. 1984 Progressive background in moths, and a quantitative measure of crypsis. *Biol. J. Linn. Soc.* **22,** 187–231. (doi: 10.1111/j.1095-8312.1984.tb01677.x)

2. Endler JA. 1978 A predator's view of animal color patterns. In *Evolutionary biology*, (eds MK Hecht, WC Steere, B Wallace) pp. 319–364. New York, NY: Springer.

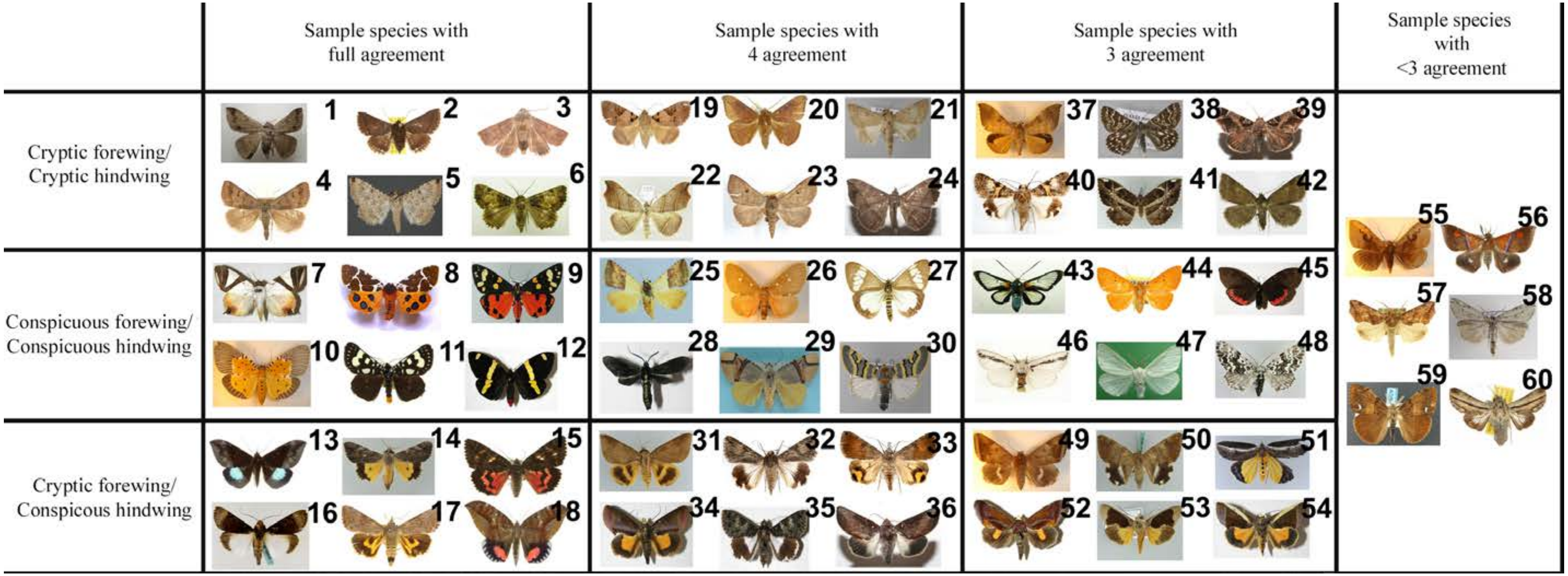
3. Arbuckle K, Speed MP. 2015 Antipredator defenses predict diversification rates. *Proc. Natl.*

Acad. Sci. **112,** 13597–13602. (doi: 10.1073/pnas.1509811112)

4. Summers K, Clough ME. 2001 The evolution of coloration and toxicity in the poison frog family (Dendrobatidae). *Proc. Natl. Acad. Sci.* **98,** 6227–6232. (doi: 10.1073/pnas.101134898)



Supplementary Figure S1. Examples of cryptic, conspicuous, and contrasting species with their phylogenetic relationship and wingspan. (*a*) Coloration classification and body sizes of moths within a molecular phylogeny for the family Erebidae. The barplot on the right side depicts the wingspan of each species. The colours of bars refer to the classified coloration of each species. (*b*) The mean (± 1 s.e.m.) of the wingspan of moths in each group without controlling for phylogenetic correlation. (*c*) The differences (± 1 s.e.m.) in phylogenetic estimators in PGLS model. (*d*) Photos of representative species that were categorized as either cryptic (left; *Phoberia atomaris*), conspicuous (middle; *Peridome orbicularis*), or contrasting (right; *Eudocima phalonia*). Photo credits (*P. atomaris*, Huemer P.; *P. arbicularis*, BIO Photography group; *E. phalonia*, Kang C.)

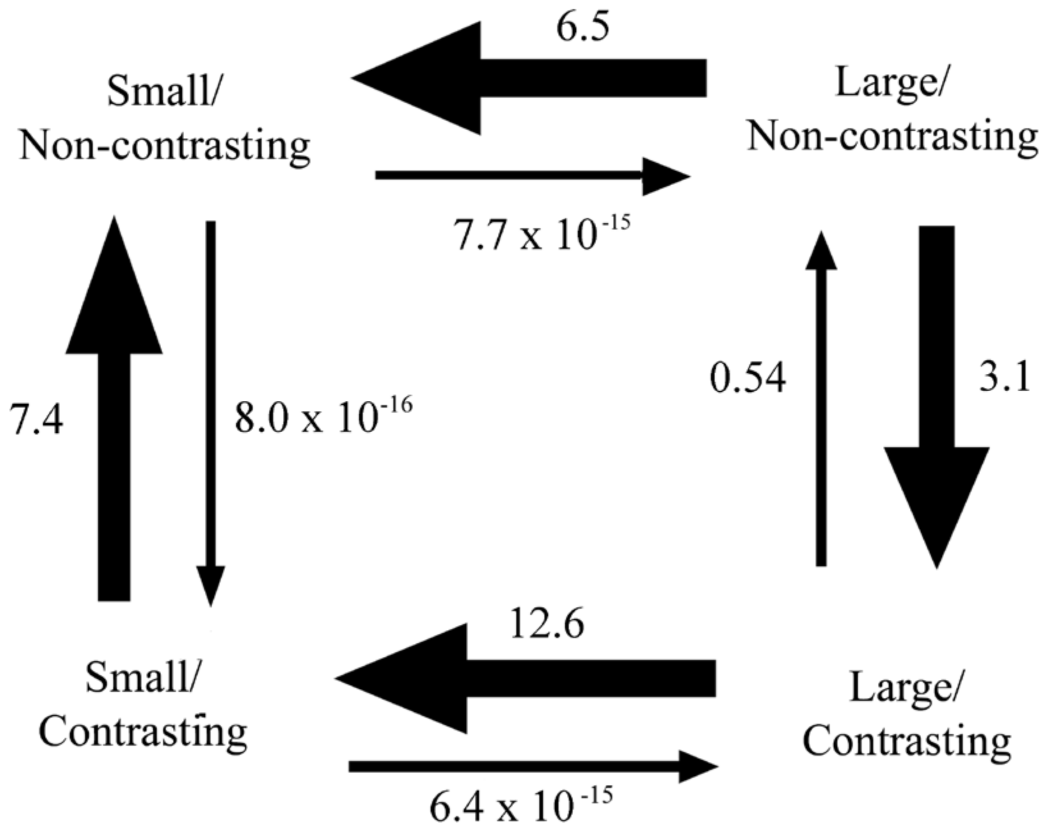


Supplementary Figure S2. Sample images of the moths that were classified as "cryptic" (upper), "conspicuous" (middle), and "contrasting" (lower). Each column shows the species that all 5 volunteers agreed for their classification (left), 3 volunteers agreed for their classification (centre), and species that less than 3 volunteers agreed on their classification (right). All images were obtained from BOLDSYSTEM (http://http://boldsystems.org/) with Creative Commons licence for free distribution. Species name and copyright licence holder can be found in Supplementary Table S1.

Supplementary Table S1. The list of species name and licence holder for the images in figure S2.

ID	Species name	License holder
1	*Ericeia subcinerea*	M. Sajjad Mirza
2	*Praxis porphyretica*	CBG Photography Group
3	*Pantydia diemeni*	Andrew Mitchell
4	*Phoberia atomaris*	CBG Photography Group
5	*Heteropalpia acrosticta*	Unspecified
6	*Daddala lucilla*	Unspecified
7	*Eulepidotis rectimargo*	Daniel H. Janzen
8	*Arctia caja*	CBG Photography Group
9	*Callimorpha dominula*	Axel Hausmann
10	*Peridrome orbicularis*	Peter Huemer
11	*Periscepta polysticta*	CSIRO/BIO Photography Group
12	*Pseudophaloe troetschi*	Daniel H. Janzen
13	*Ischyja manlia*	CSIRO/BIO Photography Group
14	*Ulotrichopus macula*	Axel Hausmann
15	*Catocala sponsa*	CBG Photography Group
16	*Audea bipunctata*	Axel Hausmann
17	*Hypocala deflorata*	CBG Photography Group
18	*Phyllodes imperialis*	CSIRO/BIO Photography Group
19	*Serrodes campana*	CSIRO/BIO Photography Group
20	*Platyja umminia*	CSIRO/BIO Photography Group
21	*Pandesma robusta*	Axel Hausmann
22	*Laspeyria flexula*	Axel Hausmann
23	*Panopoda rufimargo*	CBG Photography Group
24	*Anticarsia gemmatalis*	Daniel H. Janzen
25	*Eublemma anachoresis*	Axel Hausmann
26	*Tinolius eburneigutta*	Peter Huemer
27	*Nyctemera baulus*	CSIRO/BIO Photography Group
28	*Antichloris viridis*	Daniel H. Janzen
29	*Ramadasa pavo*	Pankaj Kumar
30	*Diaphone sp*	Axel Hausmann
31	*Ophiusa coronata*	Axel Hausmann
32	*Melipotis jucunda*	CBG Photography Group
33	*Bulia deducta*	CBG Photography Group
34	*Gonodonta lincus*	Daniel H. Janzen
35	*Melipotis punctifinis*	Daniel H. Janzen
36	*Hemicephalis alesa*	Daniel H. Janzen
37	*Oxyodes scrobiculata*	Peter Huemer
38	*Callistege mi*	Axel Hausmann
39	*Calyptis idonea*	Daniel H. Janzen

40	*Forsebia perlaeta*	CBG Photography Group
41	*Erebus ephesperis*	Axel Hausmann
42	*Phytometra viridaria*	Unspecified
43	*Cocytia durvillii*	Unspecified
44	*Homodes crocea*	CSIRO/BIO Photography Group
45	*Dysschema leucophaea*	Daniel H. Janzen
46	*Oenosandra boisduvalii*	CBG Photography Group
47	*Leucoma salicis*	Christian Wieser
48	*Panthea coenobita*	Marko Mutanen
49	*Artena dotata*	Peter Huemer
50	*Achaea serva*	Axel Hausmann
51	*Eligma narcissus*	Axel Hausmann
52	*Gonodonta fulvangula*	Daniel H. Janzen
53	*Gonodonta milla*	Axel Hausmann
54	*Gonodonta nutrix*	Daniel H. Janzen
55	*Spirama retorta*	Peter Huemer
56	*Sympis rufibasis*	CSIRO/BIO Photography Group
57	*Oraesia emarginata*	CSIRO/BIO Photography Group
58	*Coscinia cribraria*	Peter Huemer
59	*Orgyia antiqua*	CBG Photography Group
60	*Aegilia describens*	CBG Photography Group



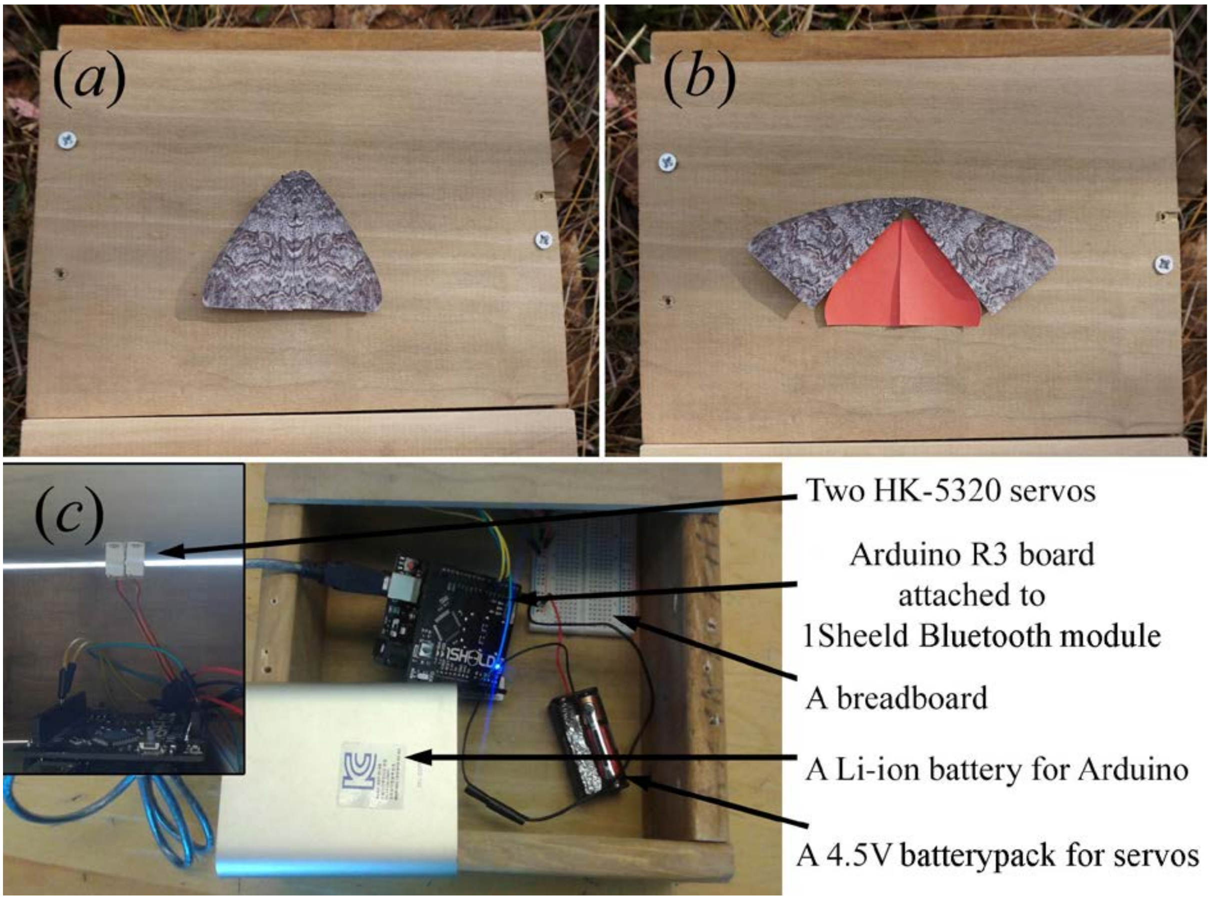
Supplementary Figure S3. The estimated transition rates between states. The width of arrows represents the transition rates in that thicker arrows indicate higher transition rates.

Supplementary methods: description of the robotic moth

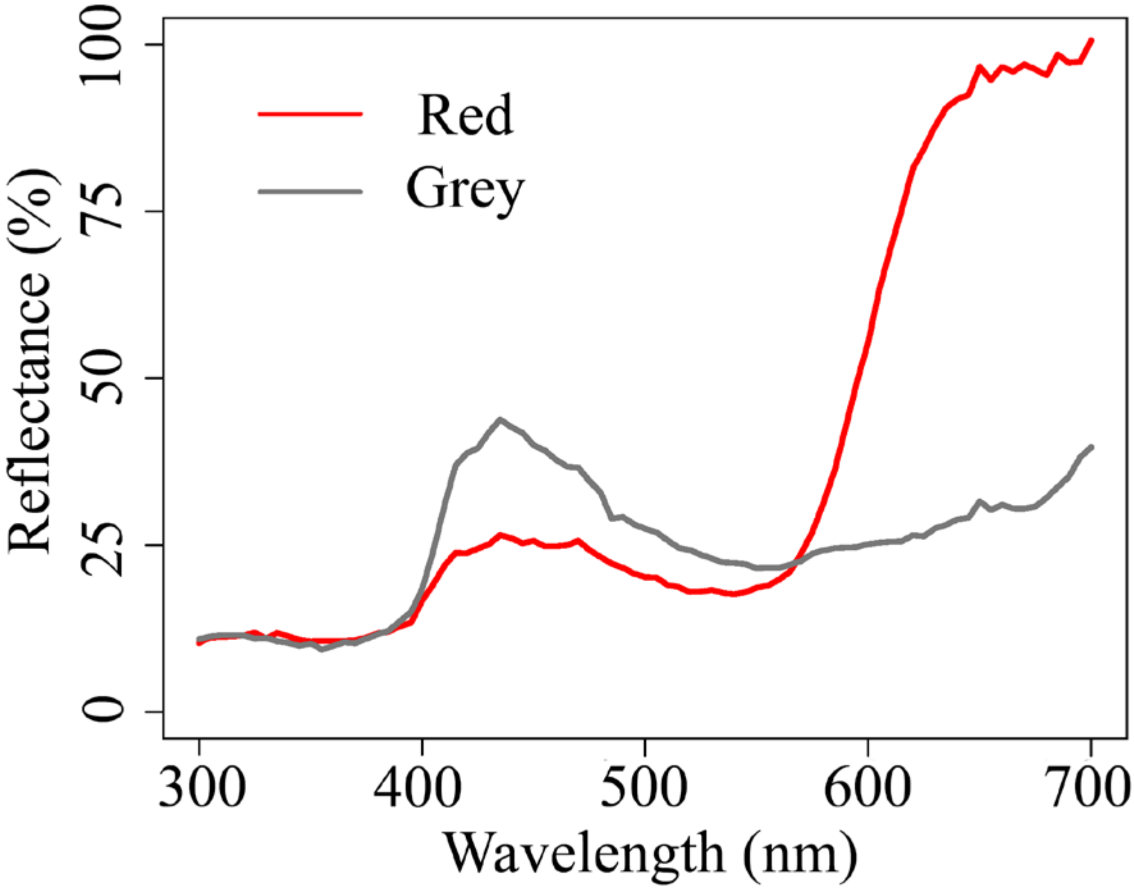
The robotic moth was presented on a wooden box (21×31×9 cm) inside which all electronic mechanisms were hidden (figure S4). For the wing parts, we used two servos (HK-5320 Ultra-micro digital servo 1.7g, HobbyKing, http://www.hobbyking.com; note here that this servo was the smallest servo available and generated the least amount of torque which enabled us to mimic the quick opening of insect wings with the minimal mechanical noise), fixed on the top surface of the wooden box. The main body of servos was hidden, but only the rotating wing parts (where printed paper wings were attached) were visible from the outside through two small holes.

Inside the box, we used Arduino UNO R3 board (open-source electronics platform, https://www.arduino.cc) attached to a 1Sheed Bluetooth® module (Integrate Inc., Scottsdale, AZ, USA, http://1sheeld.com) to control the wing display moment through a mobile application. The wing display moment was controlled by one experimenter (Kang C) throughout the experiment. The angle between the initial position and the displaying position was approximately 40° (figure S4), the latency till the full display was < 0.1 s. The display was maintained for 3 seconds, then the wings rotated back to the initial position with the same speed. The Arduino and Bluetooth boards were powered by a Li-ion battery, and the two servos were separately powered by a 4.5V battery pack.

The wings of the moth was printed on Xerox business 5300 paper (Xerox, Norwark, CT, USA) using HP Photosmart C 4680 printer (HP, Palo Alto, CA, USA). Once carefully cut, forewings were attached on the rotating wing part of the servos, hindwings were attached on the wooden board underneath the forewings (figure S4).



Supplementary Figure S4. The appearance of the robotic moth (large/red treatment) in normal status (*a*) and during deimatic display (*b*). The electronic mechanisms inside the wooden box (*c*).



Supplementary Figure S5. The reflectance spectra of the hindwing colours that we used for the behavioural experiment. The reflectance was measured using a USB2000+ spectrometer with a reflection probe and D-2000 light source (Ocean Optics, Dunedin, FL, USA).

Supplementary Table S2. The location of the study sites where we tested birds in behavioural experiment. The map of the study sites can be downloaded from National Capital Canada homepage (http://www.ncc-ccn.gc.ca/sites/default/files/pubs/nccgreenbelttrails-ceintureverduresentiersccn.pdf).

Study sites	Study dates	Locations in the map where birds were tested nearby
Stony Swamp (N45.2946°, W75.8372°)	2015/11/20 – 2015/11/24	22A-E, 23A-D, 25A, 25D, 25E, 25F, 26A-H, 26J-M, P5, P7, P8, P9, P10
Mer Bleue (N45.4042°, W75.5599°)	2015/11/26 – 2015/12/05	50G-H, 50J-L, 51A-F, 51M-O, 51R, 51V

Supplementary equations: secondary defence evolution in iteroparous prey

Consider a palatable prey species with multiple reproductive bouts during its lifetime (i.e. it is iteroparous). Let us assume the same probability of survival functions p_p, p_s, s in the main text (see the equations in Box 1). Let predators encounter prey at random in a reproductive bout so that putative encounters with individual prey before the prey's reproduction are again Poisson distributed with mean and variance λ. Under these conditions, the expected probability of an individual prey surviving a series of random encounters with predators before each reproductive bout is:

$$\sum_{i=0}^{\infty}\left(\frac{e^{-\lambda}\lambda^{i}}{i!}\right)s^{i} = e^{-\{\lambda(p_p-1)(p_s-1)\}} \qquad (4)$$

Let us also assume the external mortality, m, in that a proportion of survived prey die due to non-predatory reasons such as disease or parasitism in a reproductive bout. Under these conditions, the expected probability of an individual prey surviving a reproductive bout is:

$$s_r = e^{-\{\lambda(p_p-1)(p_s-1)\}}(1-m), \qquad (5)$$

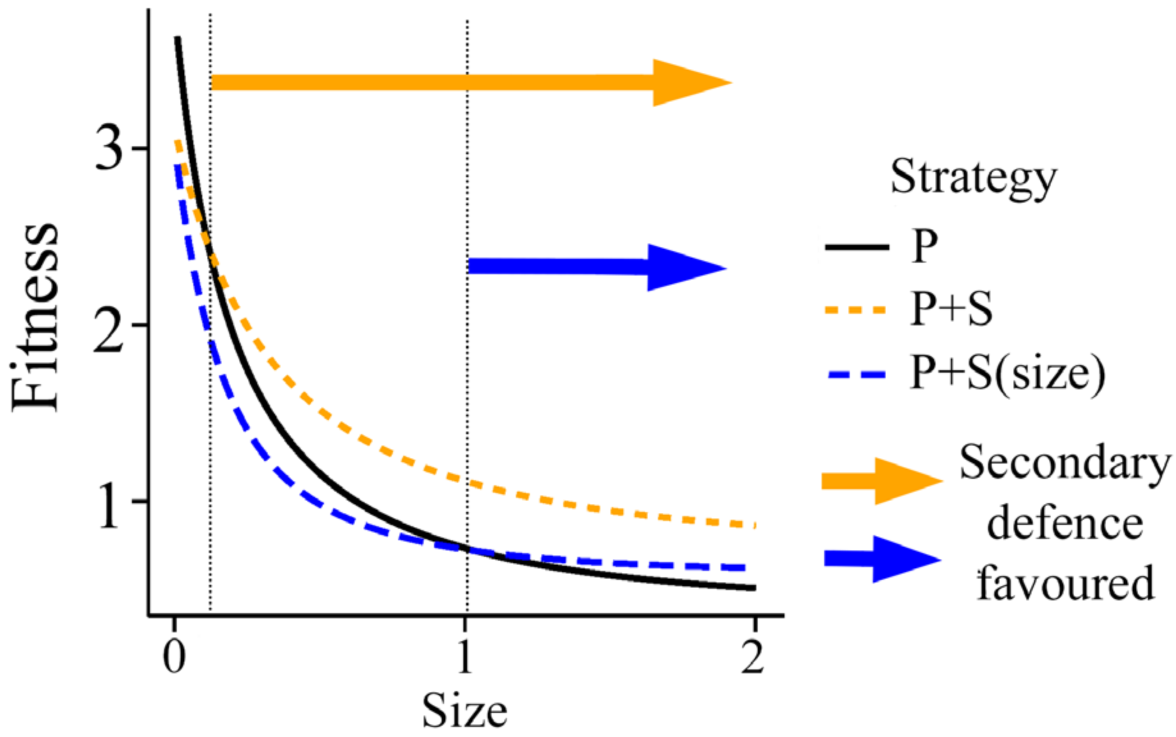
the expected lifetime of a prey then be:

$$\sum_{j=0}^{\infty} {s_r}^{j}(1-s_r)j = \frac{s_r}{1-s_r}. \qquad (6)$$

The fitness of a prey in terms of its reproductive success is given by

$$w = \frac{s_r}{1-s_r}(b-\tau) \qquad (7)$$

where b is the mean fecundity of the prey for each reproduction and τ is the fecundity cost of carrying the secondary defence. The results of this model are qualitatively identical to those of semelparous prey model (figure S6): when the crypsis of a prey item decreases with increasing body size (in the form of $p_p = ce^{-\alpha z}$, where c is maximum crypsis, z is body size), then costly secondary defences will be selected for only in prey above a threshold size, and this threshold size will also depend on how the effectiveness of the secondary defence (such as deimatic display) varies with body size.



Supplementary Figure S6. Fitness of an iteroparous prey as a function of body size when larger prey suffer higher detection costs (α = 1). The black solid line (size-dependent primary defence only, P) indicates the fitness of prey when they rely on crypsis without having any secondary defence (d = 0, β = 0, τ = 0); the orange dotted line (primary plus size-independent secondary defence, P + S) indicates the fitness of prey when they have a secondary defence whose effectiveness is independent of body size (d = 0.5, β = 0, τ = 0.2); the blue dashed line (primary plus size-dependent secondary defence, P + S(size)) indicates the fitness of prey when the effectiveness of the secondary defence increases as the prey size increases (d = 0.5, β = 1, τ = 0.2). Other parameters values: c = 0.99, λ = 1, b = 1, m = 0.2. When the fitness of one particular defensive strategy exceeds another then it will be favoured (marked by arrows, dependent on how the effectiveness of the secondary defence varies with body size).

Supplementary Table S3. The full list of species used for the analysis with the reference where we found coloration and wingspan information. NA indicates that information was not available. NC: Non-contrasting, C: contrasting.

Species	Wingspan	Classified coloration (contrast)	Classified coloration (3 agreement)	Reference	Phylogeny source
Acantholipes circumdata	20-45	NC	Cryptic	1	41
Acantholipes regularis	24-26	NC	Cryptic	2	41
Achaea serva	62-82	NC	Contrasting	3	41
Aedia leucomelas	35	C	Contrasting	4	41
Aegilia describens	39	NC	NA	5	41
Alesua etialis	NA	NA	NA	NA	41
Allotria elonympha	33-44	C	Contrasting	6	41
Amerila astreus	60-68	NC	Cryptic	1	41
Amphipyra perflua	44-54	C	Cryptic	4	41
Amyna octo	20	NC	Cryptic	3	41
Anacrostis sp	NA	NA	NA	NA	41
Anisoneura salebrosa	60-70	NC	Cryptic	7	41
Anoba anguliplaga	NA	NA	NA	NA	41
Anomis involuta	40	NC	Cryptic	3	41
Anomis metaxantha	46	NC	Cryptic	8	41
Antiblemma fuscireticulata	NA`	NC	Cryptic	NA	41
Anticarsia gemmatalis	34-40	NC	Cryptic	9	41
Anticarsia irrorata	35-40	NC	Cryptic	10	41
Antichloris viridis	36	NC	Conspicuous	4	41
Antitrisuloides catocalina	NA	C	Contrasting	NA	41
Apisa canescens	38	NC	Cryptic	11	41
Araeopteron sp	10	NC	Cryptic	3	41
Araeopteron sp	NA	NC	Cryptic	NA	41
Arcte modesta	77	NC	Cryptic	12	41
Arctia caja	70	C	Conspicuous	13	41
Arctornis sp	20	NC	Conspicuous	14	41
Artena dotata	70-75	NC	Contrasting	15	41
Asota caricae	48	C	Contrasting	16	41
Asota heliconia	60	C	Conspicuous	3	41

Audea bipunctata	41	C	Contrasting	11	41
Audea humeralis	45	C	Contrasting	11	41
Autographa gamma	38	NC	Cryptic	17	41
Autophila chamaephanes	33	NC	NA	2	41
Avatha uloptera	48.5	NC	Cryptic	12	41
Azeta ceramina	NA	NC	Cryptic	NA	41
Baniana strigata	NA	NC	Cryptic	NA	41
Barsine sp	25-32	NC	Conspicuous	12	41
Bastilla praetermissa	66	NC	Conspicuous	18	41
Belciana biformis	45	NC	Cryptic	12	41
Belciana kala	49.5	C	NA	12	41
Biuncus sp	NA	NA	NA	NA	41
Biuncus sp	NA	NA	NA	NA	41
Bocula bifaria	42.5	NC	Cryptic	12	41
Brunia antica	26	NC	Cryptic	19	41
Bulia deducta	34-38	NC	Contrasting	9	41
Callimorpha dominula	45-55	C	Conspicuous	20	41
Callistege mi	25-30	NC	Cryptic	20	41
Calyptis idonea	NA	NC	Cryptic	NA	41
Calyptra hokkaida	NA	NC	Cryptic	NA	41
Calyptra thalictri	40-45	NC	Cryptic	21	41
Catephia alchymista	42-48	C	Contrasting	20	41
Catoblemma semialba	14	NC	Cryptic	1	41
Catocala sponsa	60-70	C	Contrasting	20	41
Chalciope mygdon	32	C	Conspicuous	22	41
Chrysograpta igneola	NA	NC	Cryptic	NA	41
Clytie devia	39	NC	NA	23	41
Cocytia durvillii	NA	NC	Conspicuous	NA	41
Colobochyla salicalis	27	NC	Cryptic	16	41
Condate sp	18	NC	Cryptic	1	41
Condica vecors	29-38	NC	Cryptic	9	41
Corgatha nitens	13-19	NC	Cryptic	24	41
Coscinia cribraria	30-35	NC	NA	20	41
Cosmophila flava	30	NC	Cryptic	25	41
Creatonotos transiens	45	NC	Conspicuous	26	41
Crithote prominens	NA	NA	Cryptic	NA	41

Ctenucha virginica	40-50	NA	Cryptic	9	41
Cultripalpa sp	28-32	NC	Cryptic	2	41
Cyana sp	14-30	NC	Conspicuous	27	41
Daddala lucilla	48-54	NC	Cryptic	21	41
Deinopa signiplena	37	NC	Cryptic	28	41
Diaphone sp	38-53	NC	Conspicuous	11	41
Diloba caeruleocephala	33	C	Cryptic	16	41
Diopa corone	NA	C	Contrasting	NA	41
Drobeta carneopicta	NA	NA	NA	NA	41
Dyops chromatophila	37	NC	Cryptic	1	41
Dyrzela plagiata	32	NC	NA	12	41
Dysauxes famula	NA	NC	Conspicuous	NA	41
Dysschema leucophaea	52-54	C	Conspicuous	1	41
Earias clorana	16-20	C	NA	20	41
Ecpatia longinquua	NA	NC	Cryptic	NA	41
Eligma narcissus	65	C	Contrasting	15	41
Encruphion leena	35	NC	Cryptic	1	41
Enispodes purpurea	NA	NA	NA	NA	41
Episparis costistriga	47	NC	Cryptic	1	41
Epitausa dilina	40	NC	Cryptic	1	41
Ercheia cyllaria	44	NC	Contrasting	1	41
Erebus ephesperis	90	NC	Cryptic	29	41
Ericeia subcinerea	38.5	NC	Cryptic	12	41
Erygia apicalis	40	NC	Cryptic	3	41
Euaontia semirufa	21	NC	Cryptic	30	41
Eublemma albifascia	19	NC	Cryptic	1	41
Eublemma anachoresis	20	NC	Conspicuous	3	41
Eublemma purpurina	25	NC	Conspicuous	20	41
Euclidia glyphica	25-30	C	Contrasting	20	41
Eucocytia meeki	55	NC	Conspicuous	16	41
Eudocima fullonia	75-90	C	Contrasting	30	41
Eudocima salaminia	80	C	Contrasting	3	41
Eugoa bipunctata	19	NC	Cryptic	12	41
Eulepidotis rectimargo	30	NC	Conspicuous	31	41
Euplocia membliaria	70	NC	Conspicuous	21	41
Eutelia adulatrix	28	NC	Cryptic	32	41

Forsebia perlaeta	32-36	C	Cryptic	30	41
Gabara stygialis	24	NC	Cryptic	9	41
Garudinia simulana	16	NC	Conspicuous	1	41
Gonodonta uxor	38	NC	Contrasting	33	41
Gracilodes caffra	36	NC	Cryptic	11	41
Hemeroplanis finitima	20-25	NC	Cryptic	30	41
Hemicephalis alesa	NA	C	Contrasting	NA	41
Hemiceratoides sittaca	NA	NC	Cryptic	NA	41
Herminia tarsicrinalis	28-32	NC	Cryptic	20	41
Heteranassa sp	27-33	NC	Cryptic	9	41
Heteropalpia acrosticta	31-35	NC	Cryptic	1	41
Homodes crocea	30	NC	Conspicuous	3	41
Hulodes caranea	90	NC	Cryptic	3	41
Hypena baltimoralis	26-32	NC	Cryptic	9	41
Hypena laceratalis	25	NC	Cryptic	3	41
Hypena proboscidalis	35	NC	Cryptic	16	41
Hypenagonia sp	10	NC	Cryptic	3	41
Hypenodes humidalis	14-15	NC	Cryptic	20	41
Hypocala andremona	43-49	C	Contrasting	9	41
Hypocala deflorata	51-53	C	Contrasting	1	41
Hypopyra capensis	64-72	NC	Cryptic	11	41
Hyposemansis singha	29	NC	Cryptic	22	41
Hypospila bolinoides	36-43	NC	Cryptic	1	41
Hypotacha brandbergensis	NA	NA	NA	NA	41
Hypsoropha hormos	25-34	NC	Cryptic	9	41
Idia aemula	20-30	NC	Cryptic	9	41
Ischyja manlia	102-118	C	Contrasting	34	41
Laspeyria flexula	23-27	NC	Cryptic	20	41
Leucoma salicis	37-50	NC	Conspicuous	20	41
Lophoptera hemithyris	20	C	Cryptic	3	41
Luceria oculalis	15	NC	Cryptic	3	41
Luceria striata	NA	NC	Cryptic	NA	41
Lygephila maxima	55.5	NC	Cryptic	12	41
Lygephila pastinum	37-42	NC	Cryptic	20	41
Lymantria monacha	30-50	NC	NA	20	41
Lysimelia neleusalis	NA	NC	Cryptic	NA	41

Marcipa sp	22	NC	NA	30	41
Marcipa sp	NA	NC	NA	NA	41
Masca abactalis	44-48	C	Cryptic	12	41
Mecodina praecipua	50	NC	Cryptic	3	41
Melipotis jucunda	35-42	C	Contrasting	9	41
Melipotis punctifinis	35-42	C	Contrasting	9	41
Metaemene albiguttata	NA	NA	NA	NA	41
Metalectra edilis	19	NC	Cryptic	29	41
Micronoctua sp	6-9	NC	Cryptic	35	41
Miniodes phaeosoma	70-80	C	Contrasting	15	41
Mocis latipes	44	NC	Cryptic	9	41
Negeta signata	23	NC	Cryptic	22	41
Neochera inops	50	NC	Cryptic	36	41
Noctua fimbriata	45-55	NC	Contrasting	20	41
Nodaria verticalis	NA	NA	NA	NA	41
Nola aerugula	15-20	NC	Cryptic	20	41
Notodonta dromedarius	35-40	NC	Cryptic	20	41
Nychioptera noctuidalis	18	NA	Cryptic	30	41
Nyctemera baulus	40	NC	Conspicuous	3	41
Nygmia plana	NA	NC	Cryptic	NA	41
Oenosandra boisduvalii	50	NC	Conspicuous	3	41
Oglasa ansorgei	NA	NA	NA	NA	41
Ommatophora luminosa	50-55	NC	Cryptic	15	41
Ophiusa coronata	60	C	Contrasting	3	41
Ophiusa tirhaca	50	NC	Conspicuous	3	41
Oraesia emarginata	40	C	NA	3	41
Oraesia excavata	45	NC	Cryptic	4	41
Orgyia antiqua	25-30	NC	NA	20	41
Ossonoba torpida	37-41	NC	Cryptic	12	41
Oxidercia toxea	29	NC	Cryptic	33	41
Oxycilla ondo	26	NC	Cryptic	1	41
Oxyodes scrobiculata	50-60	NC	Cryptic	15	41
Pandesma robusta	38-40	NC	Cryptic	2	41
Pangrapta bicornuta	NA	NC	Cryptic	NA	41
Pangrapta decoralis	23	NC	Cryptic	9	41
Panopoda rufimargo	40	NC	Cryptic	30	41

Panthea coenobita	40	NC	Conspicuous	16	41
Pantydia diemeni	30	NC	Cryptic	3	41
Paracolax tristalis	28-35	NC	Cryptic	20	41
Parangitia mosaica	NA	NA	NA	NA	41
Parascotia fuliginaria	18-28	NC	Cryptic	20	41
Parolulis absimilis	NA	NC	NA	NA	41
Pericyma cruegeri	40	NC	Cryptic	3	41
Peridrome orbicularis	72	NC	Conspicuous	16	41
Periscepta polysticta	43-56	NC	Conspicuous	2	41
Phalera bucephala	42-55	NC	Cryptic	20	41
Phoberia atomaris	38	C	Cryptic	30	41
Phyllodes eyndhoviI	100-105	C	Contrasting	15	41
Phytometra viridaria	20	NC	Cryptic	16	41
Platyja umminia	58	NC	Cryptic	1	41
Platyjionia mediorufa	NA	NC	Conspicuous	NA	41
Plecoptera major	NA	NA	NA	NA	41
Plusiodonta nitissima	NA	NC	Cryptic	NA	41
Poeta denotalis	NA	NC	Cryptic	NA	41
Polypogon strigilatus	30-35	NC	Cryptic	37	41
Praxis porphyretica	40	NC	Cryptic	3	41
Prolophota trigonifera	22	NC	Cryptic	24	41
Pseudbarydia crespula	59	NC	Cryptic	1	41
Pseudoarcte melanis	66	NC	Cryptic	11	41
Pseudophaloe troetschi	48	NC	Conspicuous	1	41
Psimada quadripennis	43	NC	Cryptic	22	41
Ramadasa pavo	38	C	Conspicuous	21	41
Raphia abrupta	28	NC	Cryptic	30	41
Rema costimacula	45	NC	Cryptic	4	41
Rhesala imparata	20	NC	Cryptic	38	41
Risoba obstructa	25-30	NC	Cryptic	3	41
Rivula ochrea	NA	NC	Cryptic	NA	41
Rivula sericealis	18-22	NC	Cryptic	20	41
Rusicada fulvida	41	NC	Cryptic	11	41
Sanys irrosea	NA	NC	Cryptic	NA	41
Saroba pustulifera	NA	NC	Cryptic	NA	41
Schistorhynx argentistriga	NA	NC	Cryptic	NA	41

Schrankia costaestrigalis	16-22	NC	Cryptic	20	41
Scolecocampa liburna	35-43	NC	Cryptic	9	41
Scoliopteryx libatrix	40-45	NC	Cryptic	20	41
Serrodes campana	69-75	NC	Cryptic	5	41
Simplicia pachycera	NA	NA	NA	NA	41
Sosxetra grata	35	NC	Cryptic	1	41
Sphingomorpha chlorea	65	NC	Cryptic	32	41
Spirama retorta	50	NC	NA	15	41
Stauropus fagi	45-60	NC	Cryptic	20	41
Sympis rufibasis	37-41	NC	NA	2	41
Syntomis phegea	35-40	NC	Conspicuous	20	41
Sypnoides fumosa	48-51	NC	Cryptic	12	41
Tamba mnionomera	30-34	NC	Cryptic	1	41
Tamsia hieroglyphica	40	NC	Cryptic	1	41
Targalla subocellata	32-38	NC	Cryptic	2	41
Tautobriga glaucopis	NA	NA	Cryptic	NA	41
Thiacidas sp	32	C	Cryptic	11	41
Thyas metaphaea	59	NC	Cryptic	11	41
Thysania zenobia	100-150	NC	Cryptic	9	41
Tinolius eburneigutta	NA	NA	Conspicuous	NA	41
Toxonprucha sp	20-29	NC	Cryptic	9	41
Trisateles emortualis	29-35	NC	Cryptic	20	41
Ugia insuspecta	NA	NC	Cryptic	NA	41
Ugiodes cinerea	NA	NA	NA	NA	41
Ulotrichopus macula	70	C	Contrasting	18	41
Xanthodes albago	30-33	NC	Cryptic	2	41
Zale bethunei	31-40	NC	Cryptic	9	41
Zurobata rorata	NA	NA	NA	NA	41
Calyptra canadensis	33-40	NC	Cryptic	39	42
Calyptra lata	40	NC	Cryptic	24	42
Calyptra minuticornis	45	NC	Cryptic	3	42
Eudocima divitiosa	90	C	Contrasting	15	42
Eudocima tyrannus	90-100	C	Contrasting	40	42
Gonodonta fulvangula	38	C	Contrasting	30	42
Gonodonta lincus	NA	C	Contrasting	NA	42
Gonodonta milla	NA	C	Contrasting	NA	42

Gonodonta nutrix	36-40	C	Contrasting	9	42
Gonodonta sicheas	44	C	Contrasting	9	42
Gonodonta syrna	44	C	Contrasting	1	42
Oraesia nobilis	43	C	Cryptic	31	42
Phyllodes imperialis	130-150	C	Contrasting	5	42
Plusiodonta casta	25-32	NC	Cryptic	12	42
Plusiodonta coelonota	25	NC	Cryptic	3	42

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Supplementary Figure S7. Phylogenetic hypothesis of the analysed species. Support values were shown next to the branches.