

Introdução prática à fotografia digital para estudos em Ecologia e História Natural

Bloco 8:

Uso da fotografia em estudos de História Natural e Ecologia: Exemplos quantitativos

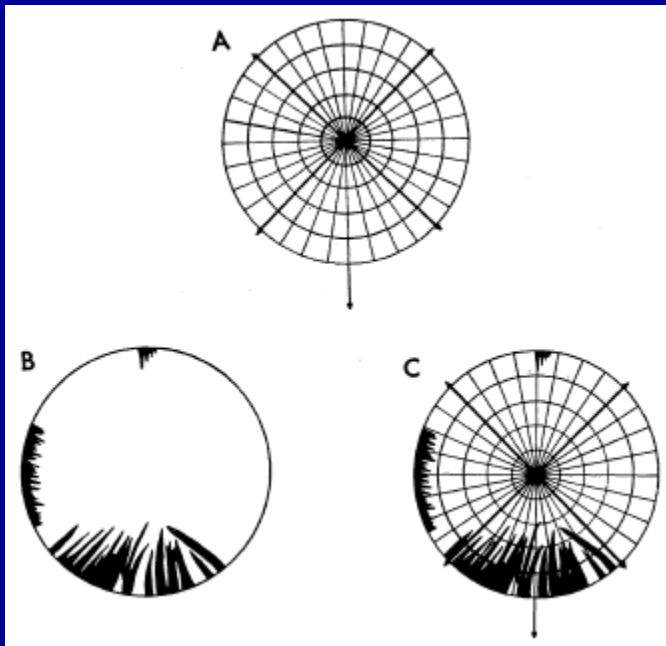
Prof. José Carlos Motta-Junior
Depto Ecologia – LABECOAVES
IB/USP

Registros quantitativos

THE USE OF A FISH-EYE LENS TO STUDY NEST PLACEMENT IN FRANKLIN'S GULLS¹

JOANNA BURGER

Ecology, Vol. 53, No. 2



Avaliação de habitats

Armadilhas Fotográficas

Para listagem e até estimativas
populacionais de animais

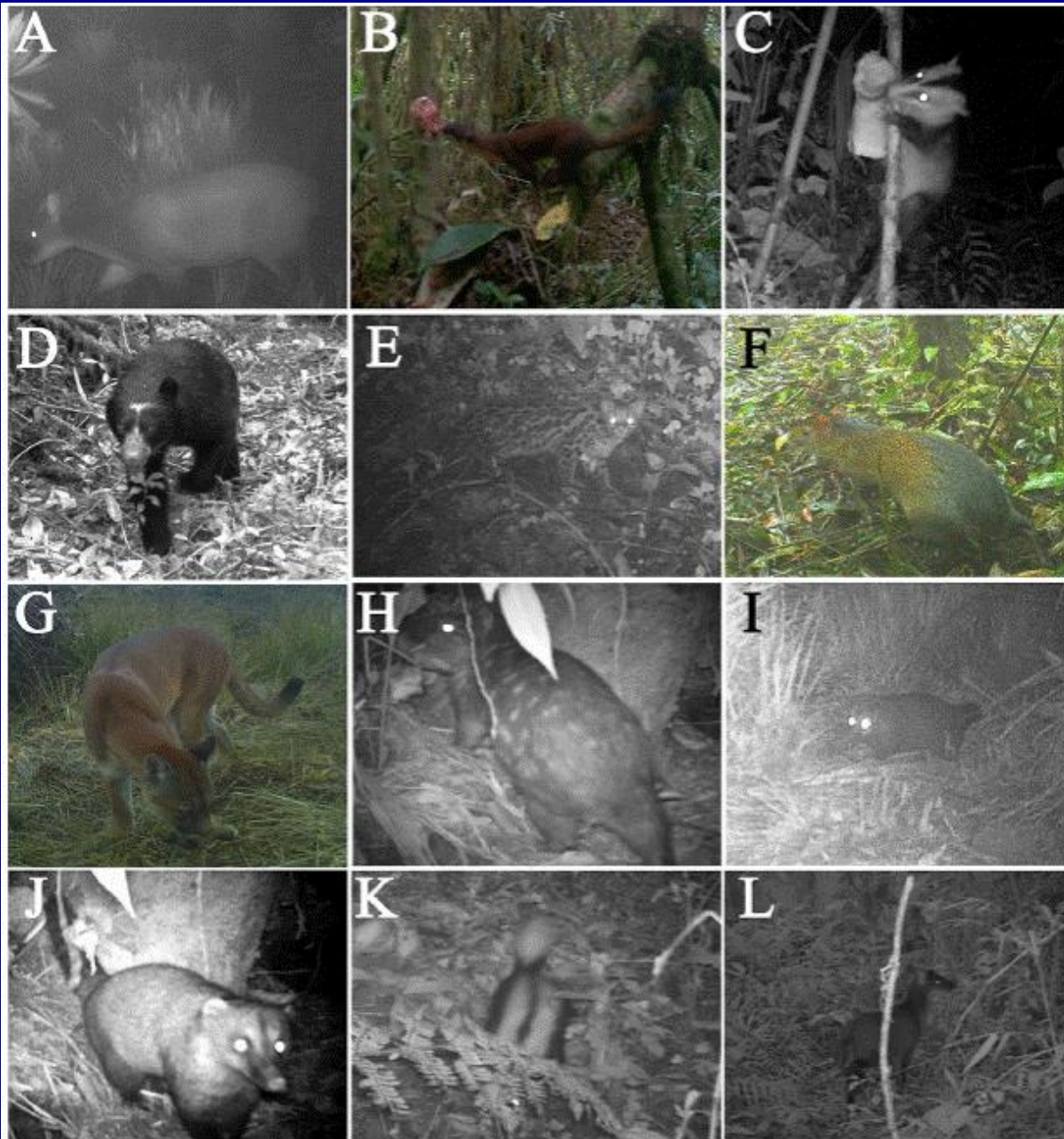


Figure 3 Species of medium and large-sized terrestrial mammals detected by camera traps at Tamá National Natural Park, Colombia: A) *Mazama rufina*, B) *Mustela frenata*, C) *Didelphis pernigra*, D) *Tremarctos ornatus*, E) *Leopardus wiedii*, F) *Dasyprocta punctata*, G) *Puma concolor*, H) *Cuniculus taczanowskii*, I) *Nasua nasua*, J) *Nasuella olivacea*, K) *Conepatus semistriatus* and L) *Mazama rufina*.
Cáceres-Martínez et al. (2016). *Theria* 7(2) online.



Allan F. O'Connell · James D. Nichols · K. Ullas Karanth

Camera Traps in Animal Ecology

Methods and Analyses



Springer

Armadilhas Fotográficas

densidade e atividade diária

8 Abundance/Density Case Study: Jaguars in the Americas

135

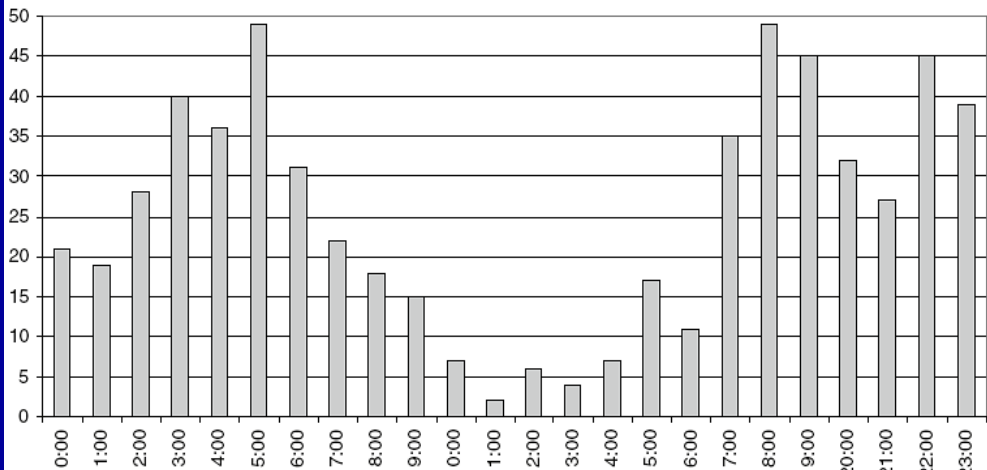


Fig. 8.4 Sample activity patterns for jaguars based on camera trapping records from Bolivia dry forest sites ($N=605$ records)

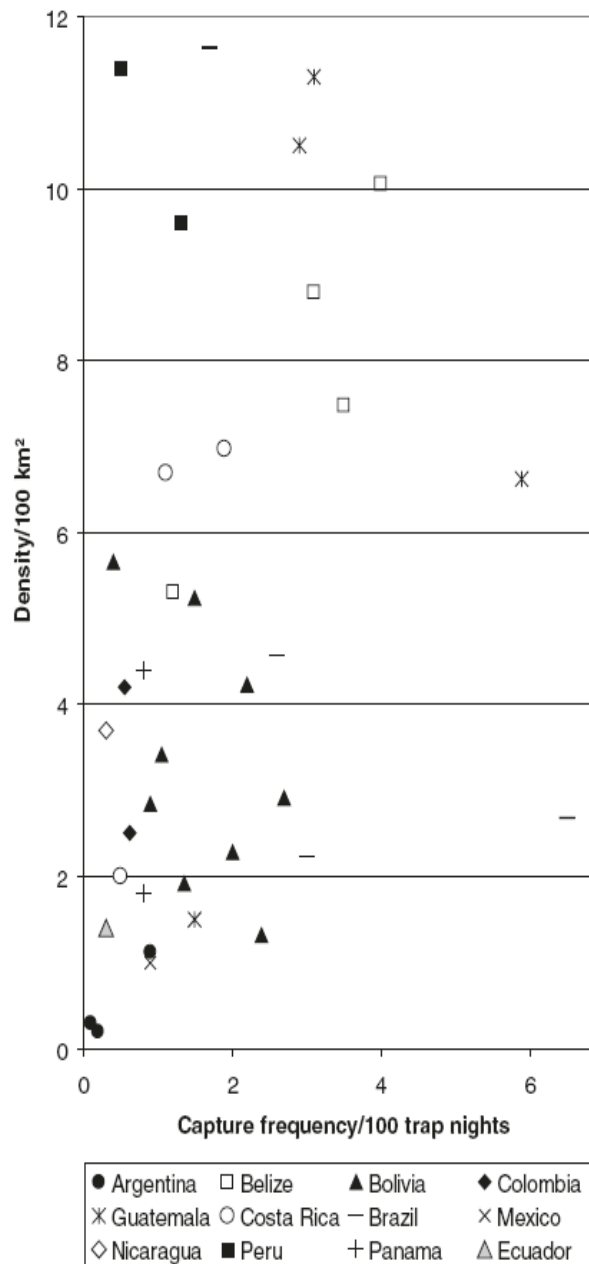


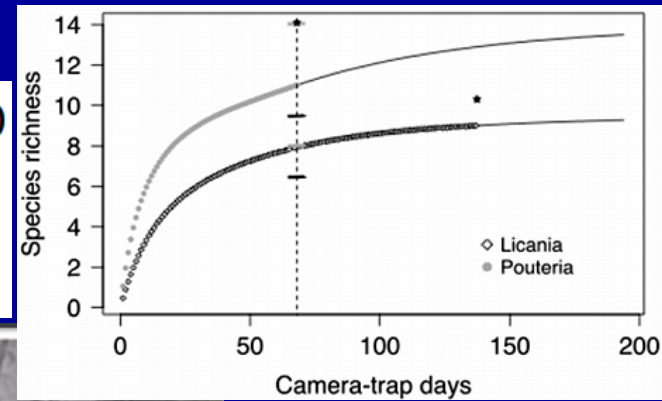
Fig. 8.3 Jaguar population density estimates relative to capture frequency (excluding the Fazenda Sete site, Brazil, with a capture frequency of 13–16 photographs per 100 trap nights and a population density of 11 individuals per 100 km²)

Armadilhas Fotográficas: frugivoria

Interactions between terrestrial mammals and the fruits of two neotropical rainforest tree species

Angela A. Camargo-Sanabria ^a, Eduardo Mendoza ^{b,*}

Acta Oecologica 73 (2016) 45–52



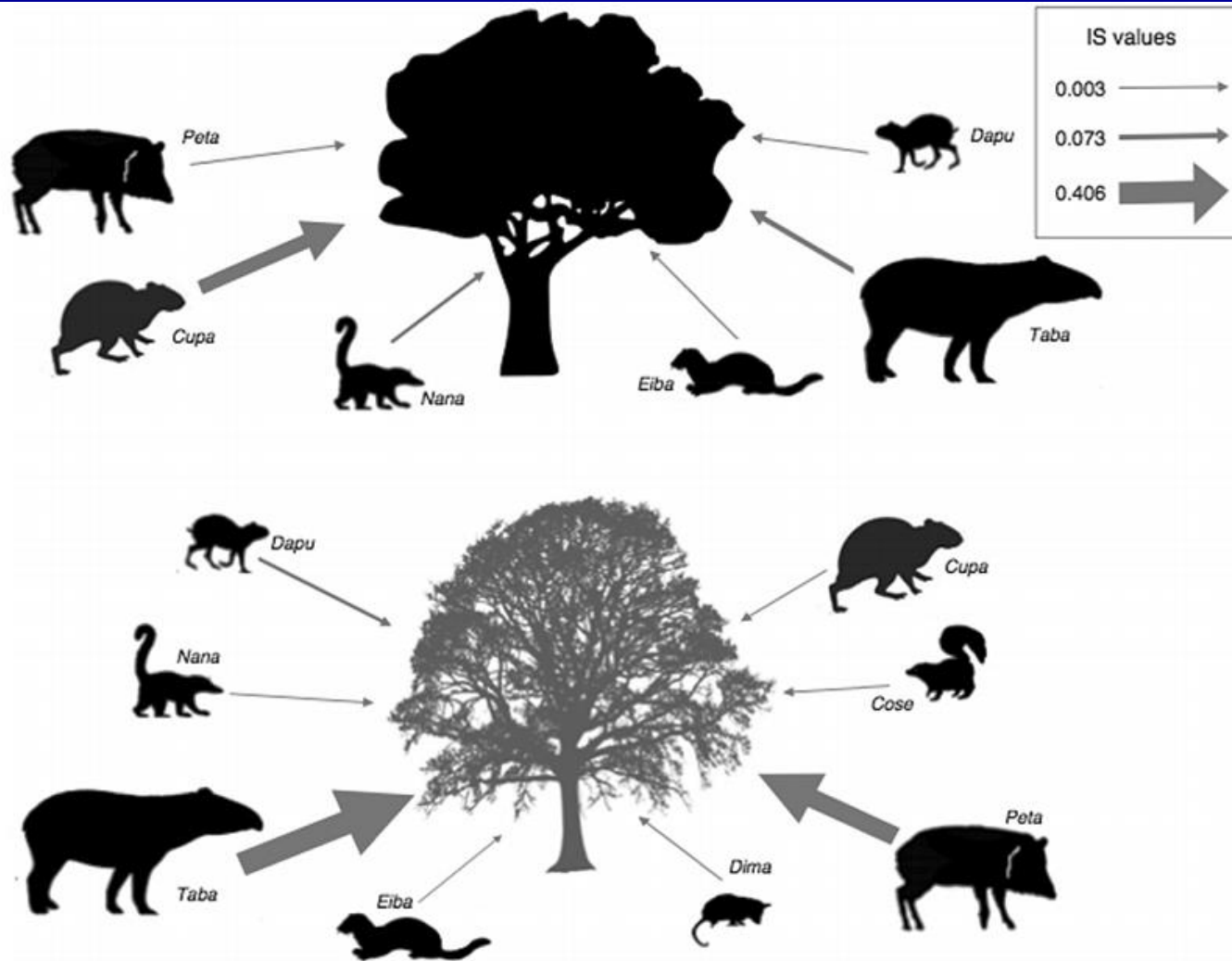


Fig. 4. Frugivore ensemble recorded in *Licania platypus* (top) and *Pouteria sapota* (bottom). Arrow thickness indicates the strength of the interaction (IS). Species codes: Cose = *Conepatus semistriatus*, Cupa = *Cuniculus paca*, Dapu = *Dasyprocta punctata*, Dima = *Didelphis marsupialis*, Eiba = *Eira barbara*, Nana = *Nasua narica*, Peta = *Pecari tajacu*, Taba = *Tapirus bairdii*.

Armadilhas Fotográficas: frugivoria

Soumya Prasad · André Pittet · R. Sukumar

Ecol Res (2010) 25: 225–231

Who really ate the fruit? A novel approach to camera trapping for quantifying frugivory by ruminants

Fig. 1 Camera-trap pictures of a frugivore (*Chital Axis axis*) consuming fallen fruit at a *Phyllanthus emblica* tree. After being triggered by animal movement, the camera was programmed to take a picture at intervals of 2 min for the next 6 min, yielding a sequence of four pictures (a 0, b 2nd, c 4th, d 6th min). Examining the difference in number of fruit seen in this time-delay sequence of pictures reveals that the chital consumed the four fallen fruit set in front of the camera within 2 min



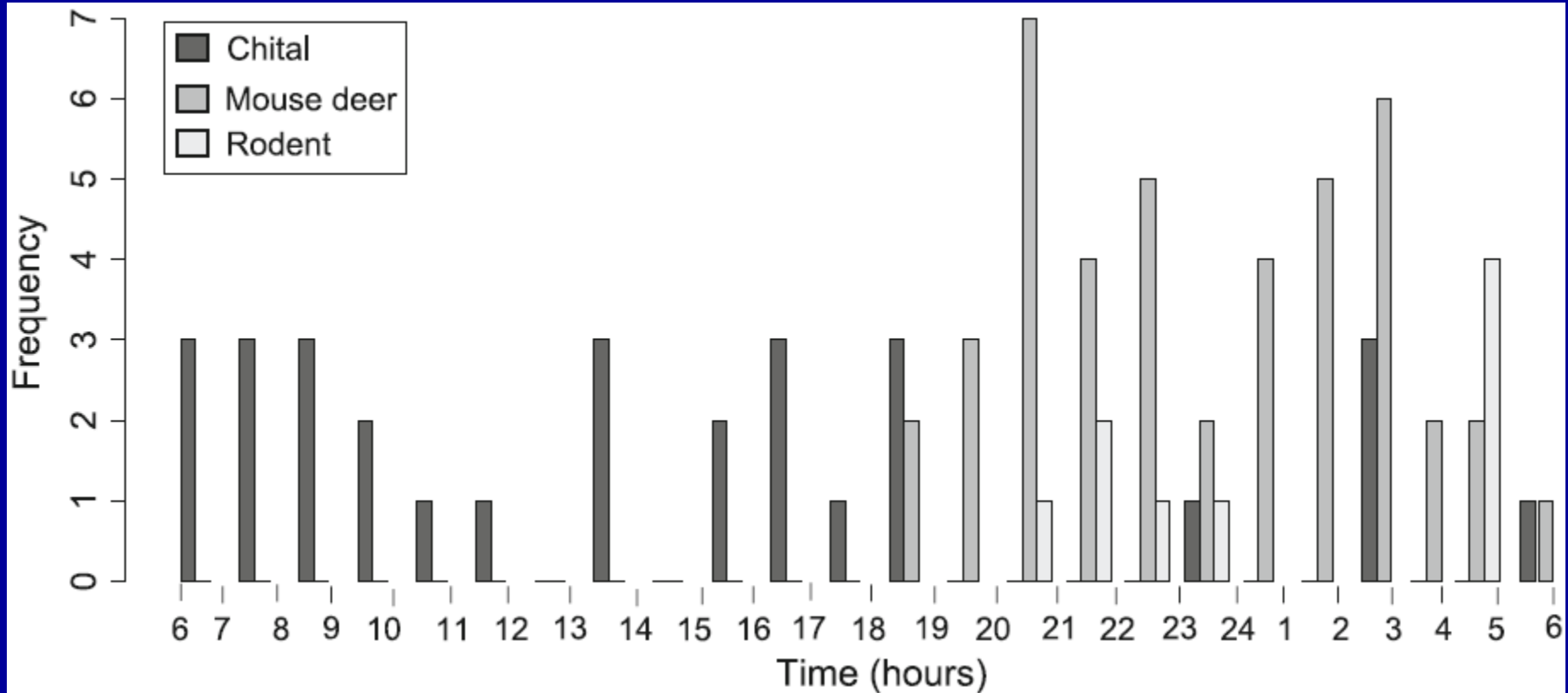


Fig. 2 Activity patterns of the three frequent frugivore species of *Phyllanthus emblica* at fruiting trees. Chital deer *Axis axis* frequented fruiting *P. emblica* trees largely in the daytime (0600–1800 hours), while the Indian chevrotain *Moschiola indica* and the rodent, Black rat *Rattus rattus*, visited the fruiting tree only at night (1800–0600 hours)

Moth floral visitors of the three rewarding *Platanthera* orchids revealed by interval photography with a digital camera

Kenji Suetsugu^{a*} and Masato Hayamizu^b

Journal of Natural History, 2014

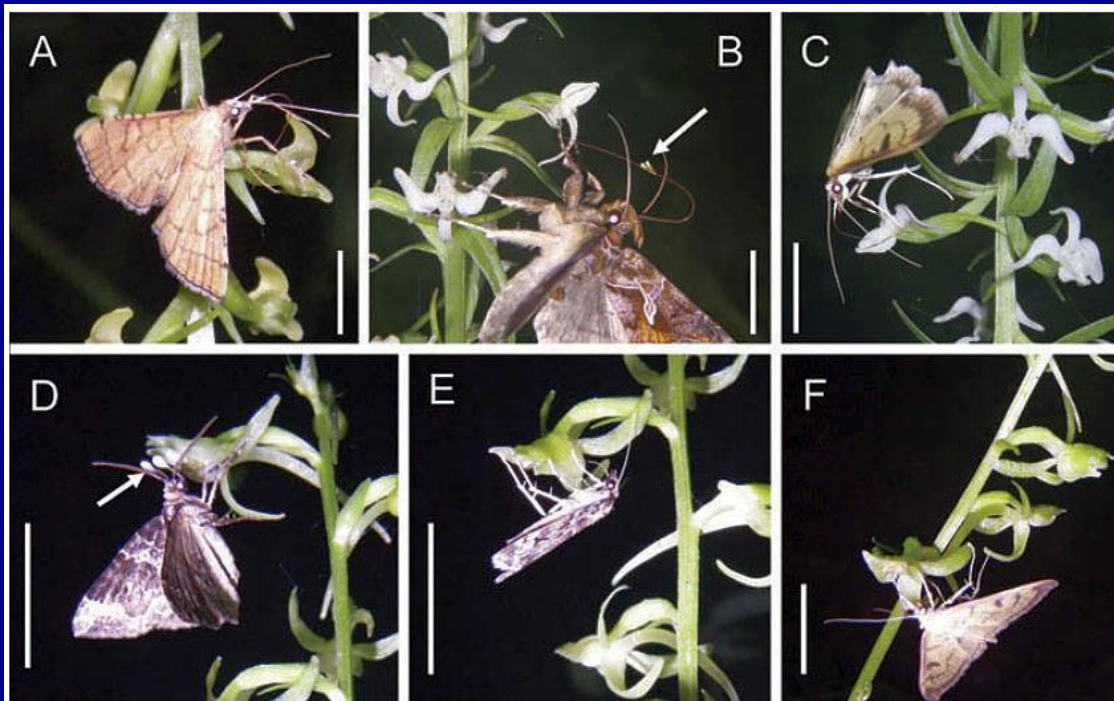


Figure 1. Floral visitors of *Platanthera* species. (A) *Mabry charonialis* visiting *Platanthera ussuriensis*; (B) *Polychrysis splendida* with *Platanthera sachalinensis* pollinia attached on the proboscis; (C) *Paratalanta* sp. visiting *P. sachalinensis*; (D) *Lampropteryx* sp. with *Platanthera florentii* pollinia attached on the eyes; (E) Scopariinae sp. visiting *P. florentii* and (F) *Paratalanta* sp. visiting *P. florentii*.



Registros quantitativos: visitantes florais

Table 2. Total number of insect visits to flowers during each observation time in *Platanthera*.

Plant species	Insect species	Frames captured	Times visited	Pollinia attached	Visting time
<i>P. ussuriensis</i>	<i>Mabry charonialis</i>	132	2	No	21:00–21:31 22:47–23:56
<i>P. sachalinensis</i> (Pop. 1)	Noctuidae sp.	1	1	Yes	20:18
<i>P. sachalinensis</i> (Pop. 2)	<i>Polychrysis splendida</i>	1	1	Yes	3:27
	<i>Paratalanta</i> sp.	1	1	No	3:59
<i>P. florentii</i>	<i>Lampropteryx</i> sp.	3	1	Yes	20:37–20:39
	<i>Paratalanta</i> sp.	3	1	No	21:19–21:21
	Scopariinae sp.	11	1	No	3:18–3:25

Registros quantitativos: visitantes florais

Pollination ecology of *Caryocar brasiliense* (Caryocaraceae) in Central Brazil cerrado vegetation

Journal of Tropical Ecology (1993) 9:199–211.
 ROGÉRIO GRIBEL*¹ and JOHN D. HAY†

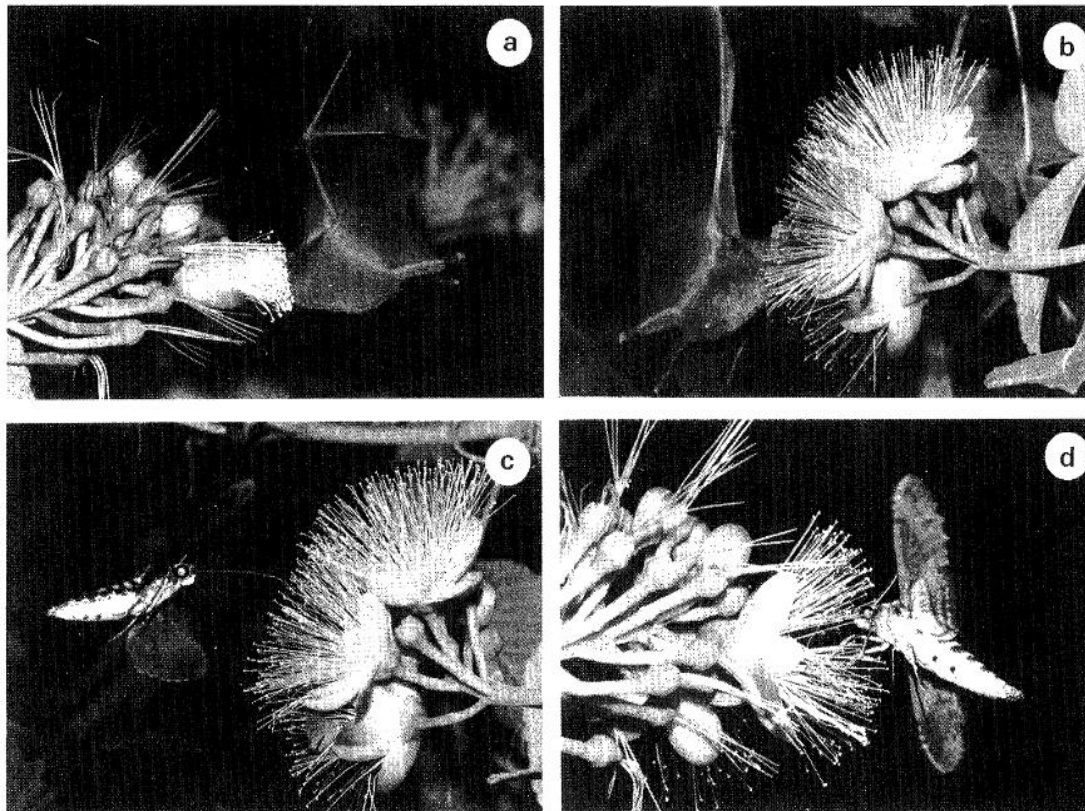


Figure 1. (a) Visit of the glossophagine bat *Anoura geoffroyi* during the staminate phase of the *Caryocar brasiliense* flowers; (b) visit of *Anoura geoffroyi* during the hermaphrodite phase of the flowers; (c) hovering flight visit of a long proboscis hawk moth (*Coecytus antaeus*); (d) landing visit of a short proboscis hawk moth (*Pseudosphinx tetrio*).

Table 3. Bats observed, captured or photographed in flowering trees of *C. brasiliense*.

Site, Date, Time	Flowers in the tree	Observed bats (size of the group)	Captured bats with pollen	Photographed bats
FAL 28 Sep 83 1830–2030	31	glossophagine (1)	1 <i>G. soricina</i>	
FAL 01 Oct 83 1830–2030	40	glossophagine (1–2)		1 <i>G. soricina</i>
RBAE 30 Mar 84 1830–2330	105	glossophagine (2–5) <i>V. lineatus</i> (3–6) <i>P. discolor</i> (8–10)		1 <i>G. soricina</i>
RBAE 08 Apr 84 1830–2300	120	glossophagine (3–8) <i>V. lineatus</i> (3–6) <i>P. discolor</i> (8–10)		
FAL 12 Apr 84 1830–0100	110	glossophagine (3–8)		3 <i>G. soricina</i>
RBAE 15 Apr 84 1830–0230	260	glossophagine (4–8) <i>P. discolor</i> (10–30)	1 <i>G. soricina</i> 3 <i>P. discolor</i>	3 <i>P. discolor</i>
RBAE 16 Apr 84 1830–0000	220	glossophagine (3–8) <i>V. lineatus</i> (2–6) <i>P. discolor</i> (10–20)	6 <i>P. discolor</i>	2 <i>P. discolor</i>
FAL* 20 Apr 84 1830–0030	75	glossophagine (2–4) <i>V. lineatus</i> (1)	2 <i>G. soricina</i> 1 <i>V. lineatus</i>	3 <i>G. soricina</i> 1 <i>V. lineatus</i>
FAL* 29 Apr 84 1830–0130	67	glossophagine (1–3) <i>V. lineatus</i> (1–4)	1 <i>G. soricina</i> 1 <i>V. lineatus</i> 1 <i>C. perspicillata</i>	1 <i>G. soricina</i>
FAL* 09 Aug 84 1830–2230	52	glossophagine (1–3)		1 <i>G. soricina</i>
FAL 15 Aug 84 1830–2200	34	glossophagine (1)		
FAL 17 Aug 84 1830–2200	25	glossophagine (1)	1 <i>G. soricina</i>	
RBAE 20 Sep 84 1830–2330	140	glossophagine (1–5) <i>V. lineatus</i> (1–3)		
FAL 24 Sep 84 1830–0000	60	glossophagine (1)		
RBAE* 06 Oct 84 1830–0400	60	glossophagine (1–3)	2 <i>G. soricina</i> 1 <i>C. perspicillata</i>	
RBAE* 13 Oct 84 1830–0430	74	glossophagine (1–3)	2 <i>G. soricina</i> 1 <i>A. geoffroyi</i>	3 <i>G. soricina</i> 5 <i>A. geoffroyi</i>

Galito - *Alectrurus tricolor*

Quantificação de dieta em vida livre:

p.ex. dieta ninhegos *Alectrurus tricolor*

LABECOAVES - Mariana Hermínio Bressan Martins



23/12 - 9:11h Diptera Conopidae; 1,2 CB



05/11 - 16:32h Lepidoptera; 0,9 CB



**Dieta ninhegos *Alectrurus tricolor*
LABECOAVES - Mariana Hermínio Bressan Martins**



23/12 – 8:45h Diptera Sarcophagidae; 0,75 CB



02/11 – 18:37 Blattidae; 1,3 CB



25/12 – 8:42h Libellulidae; 2.5 CB

25/12 – 9:29h Orthoptera Tettigoniidae; 1,2 CB



25/12 – 9:16h Orthoptera Acrididae; 1,4 CB



25/12 – 8:42h Diptera Bombyllidae; 1,0 CB



25/12 – 8:55h Eumastacidae; 2,1 CB



14/11 – 15:40h Araneae; 0,8 CB

Dieta ninhegos *Alectrurus tricolor*
LABECOAVES - Mariana Hermínio Bressan Martins



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Tabela 3. Presas entregues aos ninhegos de *Alectrurus tricolor* na Estação Ecológica de Itirapina. A classificação segue Lima (1962).

Presas	Ninho 1	Ninho 2	Ninho 3	Ninho 5	Ninho extra	Total	%
MYRIAPODA							
Diplopoda		1			2	3	0,9
ARANEAE	1	4	4	2		11	3,3
ODONATA							
Libellulidae		38	2		2	40	12,0
ORTHOPTERA							
Acrididae	1	19	11		2	33	9,9
Tettigoniidae	1	6	7		3	17	5,1
Eumastacidae					3	3	0,9
Grylloidea	1		1			2	0,6
não identificados		7	2			9	2,7
PHASMIDA (=Phasmatodea)							
Phasmidae (=Phasmatidae)			1			1	0,3
DERMAPTERA							
Forficulina			1	2		3	0,9
BLATTARIAE (=Blattaria)							
Blattidae	6	1	4	1		12	3,6
MANTODEA							
Mantidae	1	9	2			12	3,6
HEMIPTERA							
Cercopidae					1	1	0,3
HOMOPTERA	2	2				4	1,2
NEUROPTERA							
Myrmeleontidae			2			2	0,6
LEPIDOPTERA							
Noctuidae larva					1	1	0,3
larva não identificada	1		1			2	0,6
adulto n. id.		2	3			5	1,5
DIPTERA							
Sarcophagidae	3				1	4	1,2
Bombyliidae			1		2	3	0,9
Asilidae			2	1	1	4	1,2
Conopidae					1	1	0,3
não identificadas	3	15	20			38	11,4
COLEOPTERA							
Curculionidae		6	2			8	2,4
não identificados	1	17	8	2		28	8,4
HYMENOPTERA							
Formicidae rainha	1	1	1			3	0,9
não identificados		1	1			2	0,6
INSECTA não identificados	9	13	12			34	10,2
Artrópodes não identificados	6	30	8		2	46	13,9
Casca de ovo			2			2	0,6
Número total indivíduos	37	170	96	8	21	332	100,0

Dieta ninhegos *Alectrurus tricolor*
LABECOAVES - Mariana Hermínio Bressan Martins

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CP
CB

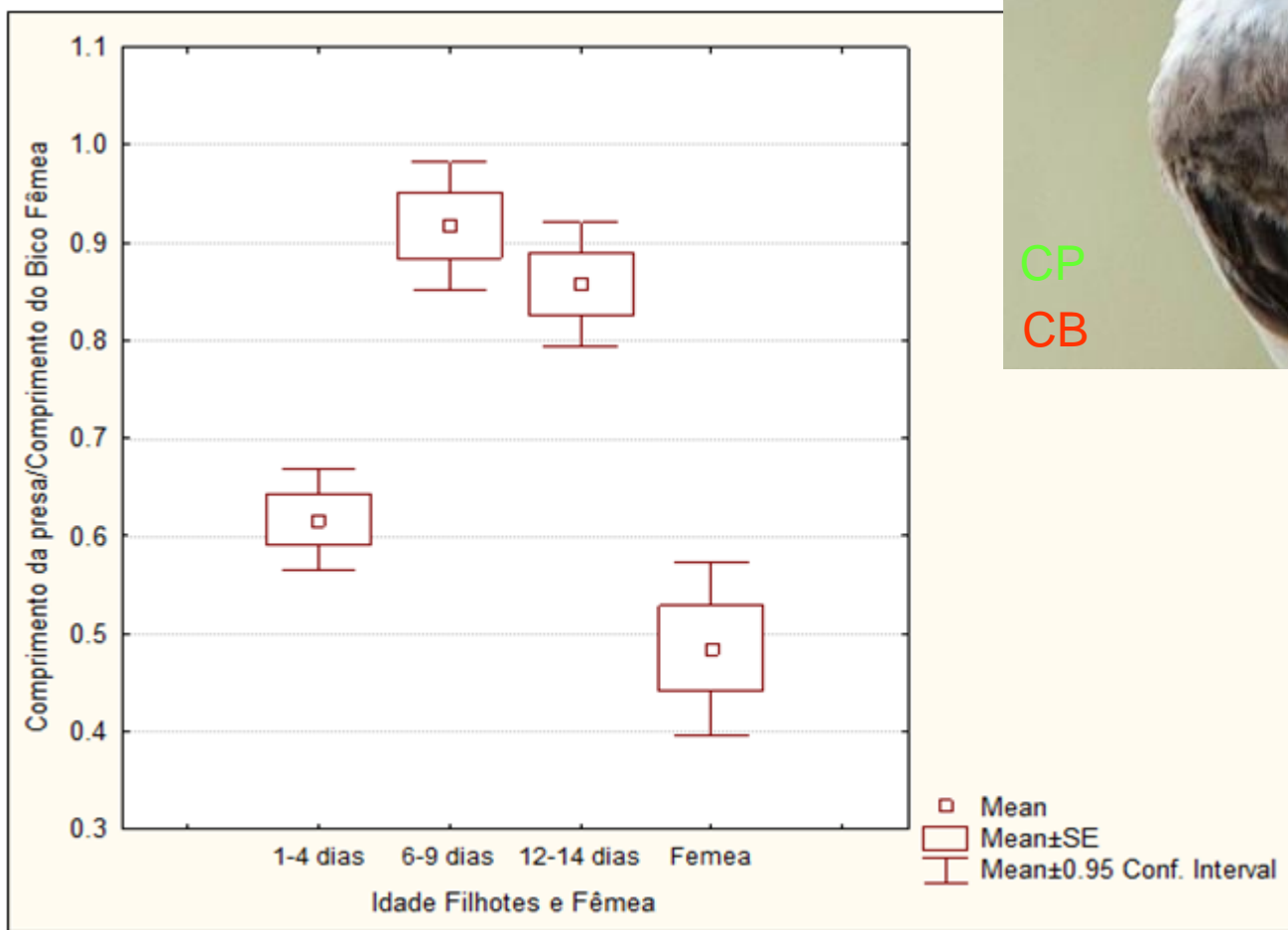
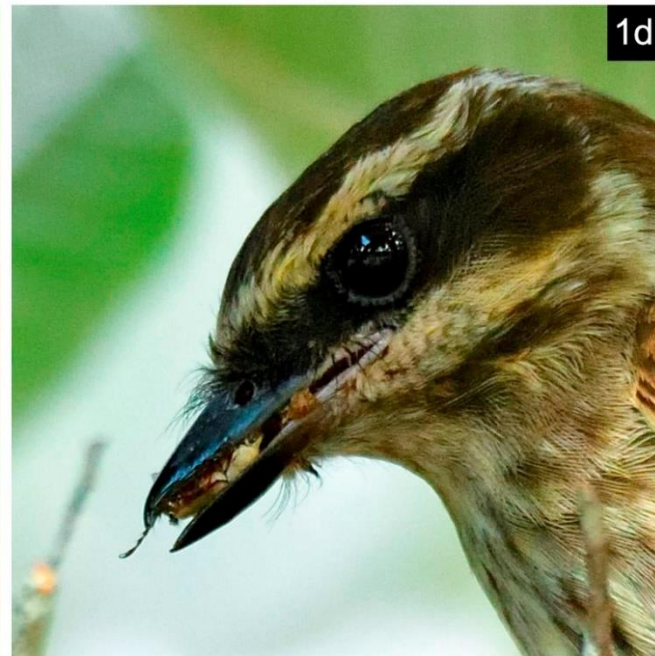


Figura 19. Tamanho médio de presa entregue em relação ao comprimento do bico da fêmea em função da idade dos ninhos e da fêmea. N1-4 dias=98, N6-9 dias=195, N12-14dias=82 e Nfêmea=36. SE= erro-padrão; Conf. Interval =intervalo de confiança.

Nestling diet and provisioning rate of Variegated Flycatcher *Empidonomus varius* in south-east Brazil; com Isabela N. Perazzolo e Martins & Manoel M. Dias Filho, no prelo *COTINGA* 2022.



Nestling diet and provisioning rate of Variegated Flycatcher *Empidonomus varius* in south-east Brazil; LABECOAVES com Isabela N. Perazzolo e Martins & Manoel M. Dias Filho, no prelo *COTINGA* 2022.



Table 1. Identity and quantification of food items provided by the adults to three Variegated Flycatcher *Empidonomus varius* nestlings during three days of observation, Itirapina Ecological Station, Brazil, November 2020. NID: unidentified.

Food items	<i>n</i>	%
Plants		
Fruit of <i>Miconia albicans</i> (Melastomataceae)	1	0.6
NID green fruit	1	0.6
NID beige fruit	1	0.6
Animals		
Araneae	1	0.6
Blattaria	1	0.6
Coleoptera (NID)	5	2.8
Coleoptera (Chrysomelidae) sp. 1	1	0.6
Coleoptera (Chrysomelidae): <i>Megalostomis</i> sp.	1	0.6
Coleoptera (Curculionidae)	1	0.6
Coleoptera (Tenebrionidae)	4	2.3
Coleoptera (Melolonthidae): <i>Macrodactylus</i> sp.	91	51.4
Diptera (Asilidae)	1	0.6
Hemiptera (Cercopidae)	1	0.6
Hymenoptera (Apidae)	1	0.6
Hymenoptera (Formicidae): winged form sp. 1	12	6.8
Hymenoptera (Formicidae): winged form sp. 2	1	0.6
Hymenoptera (Formicidae): winged form sp. 3	2	1.1
Hymenoptera (Formicidae): winged form sp. 4 large	1	0.6
Hymenoptera	3	1.7
Insecta and Arthropoda NID	21	11.9
Odonata (Libellulidae): <i>Erythrodiplax</i> sp.	2	1.1
Orthoptera (Acrididae): nymph	1	0.6
Other unidentified items	23	13.0
TOTAL	177	100.00

Quantificação de ecologia comportamental:

p.ex. forrageamento *Cypsnagra hirundinacea*

LABECOAVES – Anna Ritter; Fernanda Paschotto & Bruna G. Oliveira.





Predação de semente de *Vochysia tucanorum* (Vochysiaceae).



Alimento	Estação Chuvosa (%)	Estação Seca (%)
Artrópode	72,69	96,20
Flor	2,20	1,27
Fruto	22,91	0,00
Semente	1,76	0,00
Botão Floral	0,44	2,53
	100	100



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formigas em galho oco de *Pouteria torta* (Sapotaceae). 2014-09-10_17:10h.



Consumindo frutos de *Aegiphila* cf. *verticillata* (Lamiaceae). 2014-01-09_06:10h



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Consumo parcial de fruto maduro de *Psidium grandifolium* (Myrtaceae). 2015-04-01_15:43h.

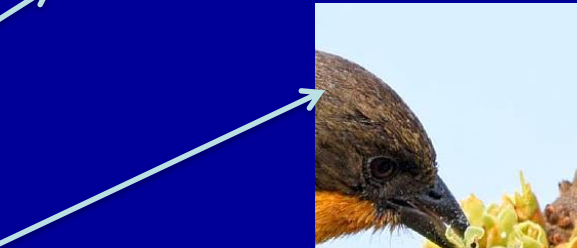
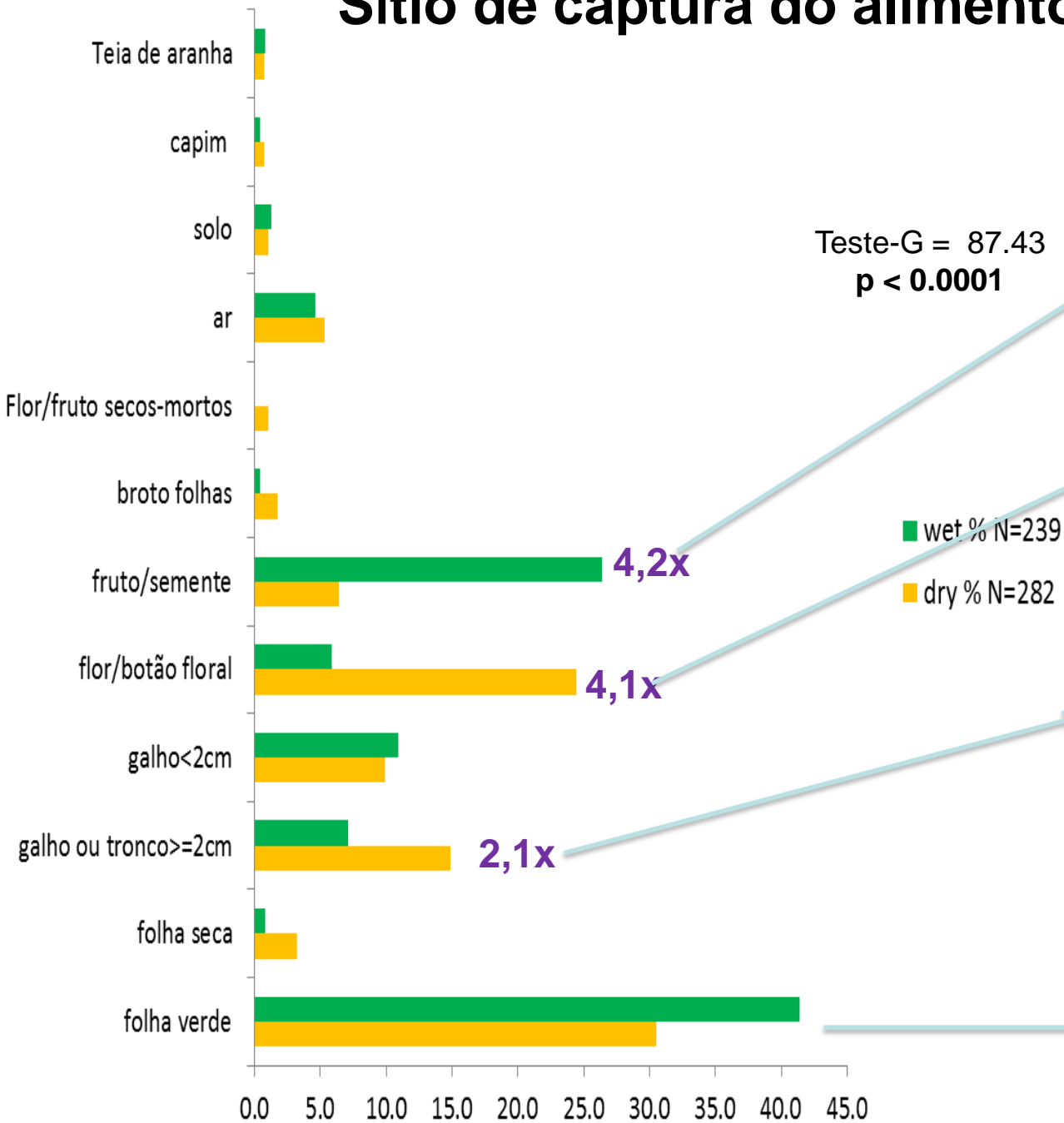


Consumo de botões florais de *Aspidosperma tomentosum* (Apocynaceae). 2013-08-29_15:44h.



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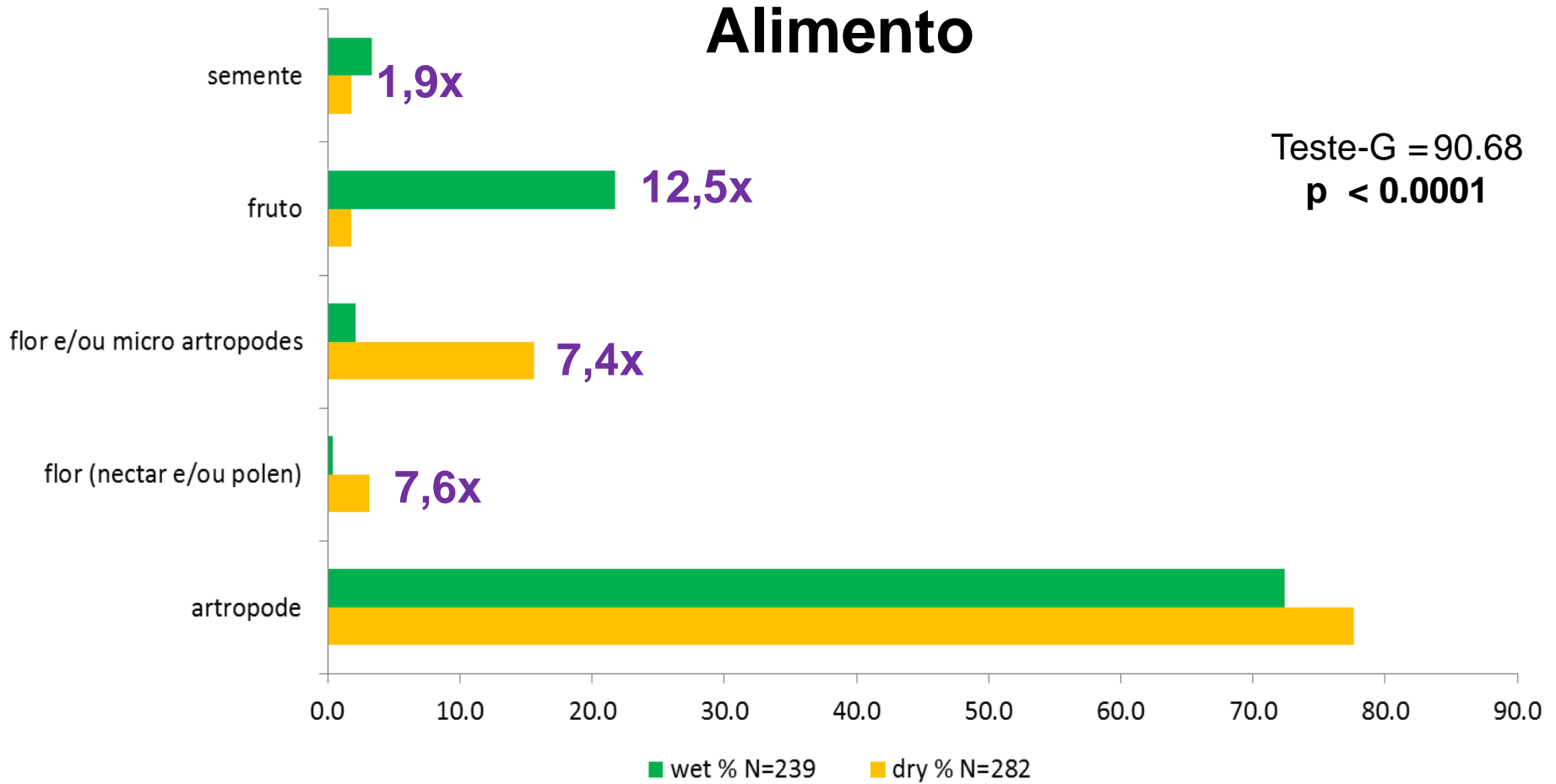
Sítio de captura do alimento



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Alimento



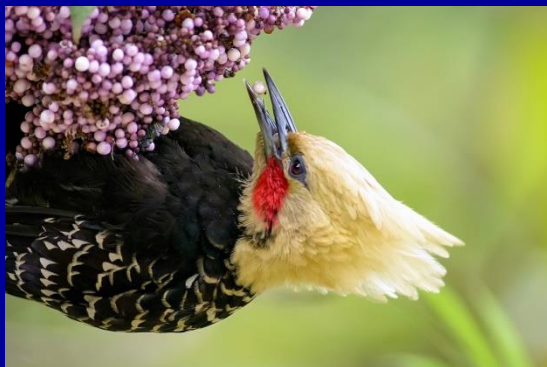
Identificar e quantificar frugívoros em *Callicarpa reevesii* – Isabela Campos 2016



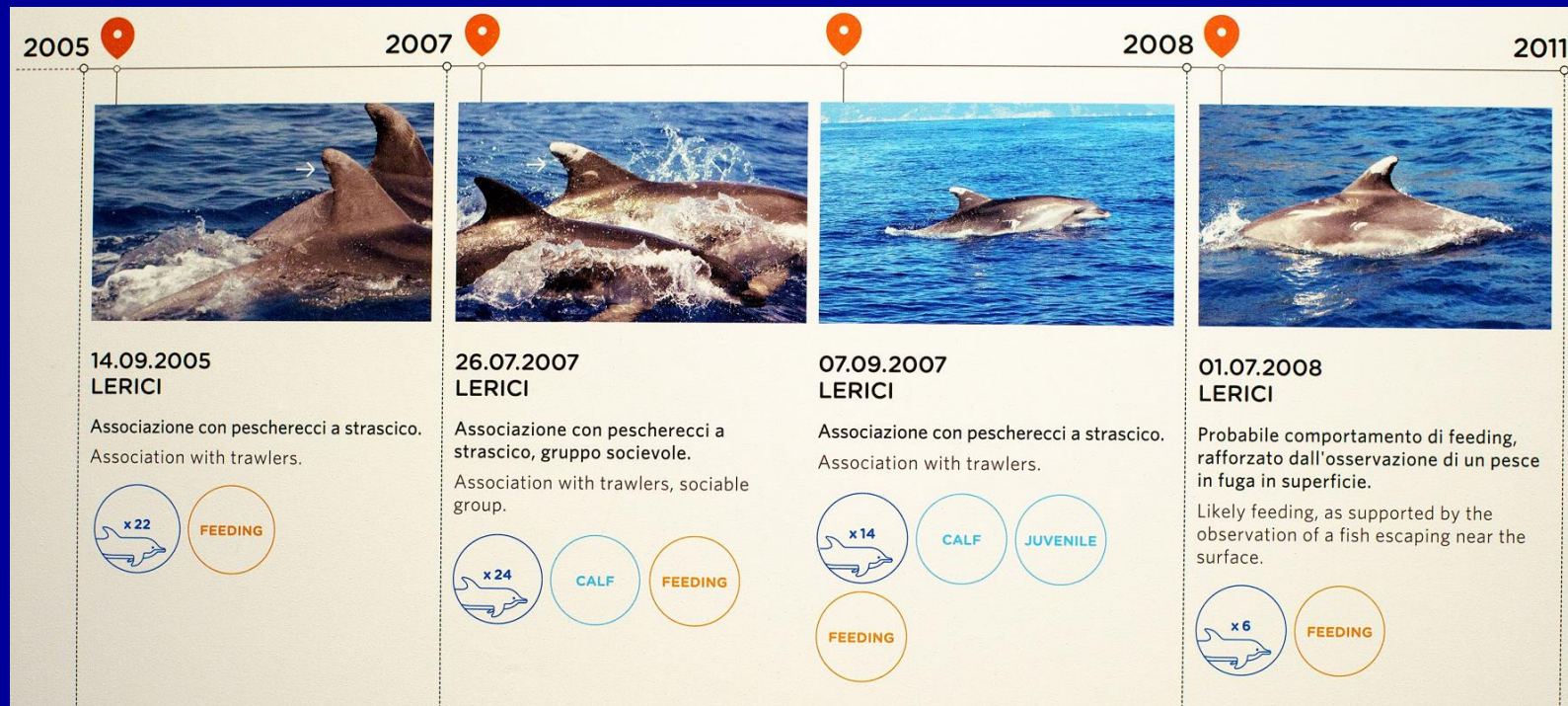
Tabela 3. Modo de manipulação dos frutos de *Callicarpa reevesii*, para as cada espécie identificada bem como o total de visitas de cada uma.

Espécie	Manipulação dos frutos	Total de visitas
<i>Thraupis sayaca</i>	Masca e engole	231
<i>Thraupis ornata</i>	Masca e engole	331
<i>Thraupis palmarum</i>	Masca e engole	21
<i>Tangara cayana</i>	Masca e engole	74
<i>Dacnis cayana</i>	Masca e engole	20
<i>Pipraeidea melanonota</i>	Masca e engole	2
<i>Turdus rufiventris</i>	Engole inteiro	265
<i>Turdus leucomelas</i>	Engole inteiro	110
<i>Pitangus sulphuratus</i>	Engole inteiro	23
<i>Celeus flavescens</i>	Engole inteiro	46

Campos (2016)



Identificar e estudar populações cetáceos - estudo oceanógrafos Aquário de Genova



© Acquario di Genova

MAMMA BIANCA

TTDM063



I PUNTI DI AVVISTAMENTO DI MAMMA BIANCA/SIGHTING SPOTS OF MAMMA BIANCA

È stata avvistata la prima volta nel 2005, nelle acque davanti a Lerici. Frequenta soprattutto l'area di studio del Golfo di La Spezia. Nel 2007 l'abbiamo incontrata in compagnia di un piccolo e questo ci ha fatto capire che si tratta di una femmina.

Inizialmente la sua pinna dorsale era completamente grigia, ma nel tempo sono comparse grosse macchie su entrambi i lati, che hanno reso un po' più laborioso il suo riconoscimento negli avvistamenti successivi. Ora per noi è inconfondibile anche a grande distanza.

Mamma Bianca was spotted the first time in 2005, in the waters in front off Lerici. She lives mainly around the Gulf of La Spezia. When we met her with a young in 2007 we realised she was a female.

At first her dorsal fin was completely grey, but over time large spots have appeared on both sides, making it a little harder to recognise her during the following sightings. Now she is unmistakable for us, even at a great distance.

Using super-high resolution satellite imagery to census threatened albatrosses

PETER T. FRETWELL,^{1*}  PAUL SCOFIELD² & RICHARD A. PHILLIPS¹

¹British Antarctic Survey, Maddingley Road, Cambridge, UK

²Canterbury Museum, Rolleston Avenue, Christchurch, New Zealand

Imagens de satélite
para censo /avaliação
populacional

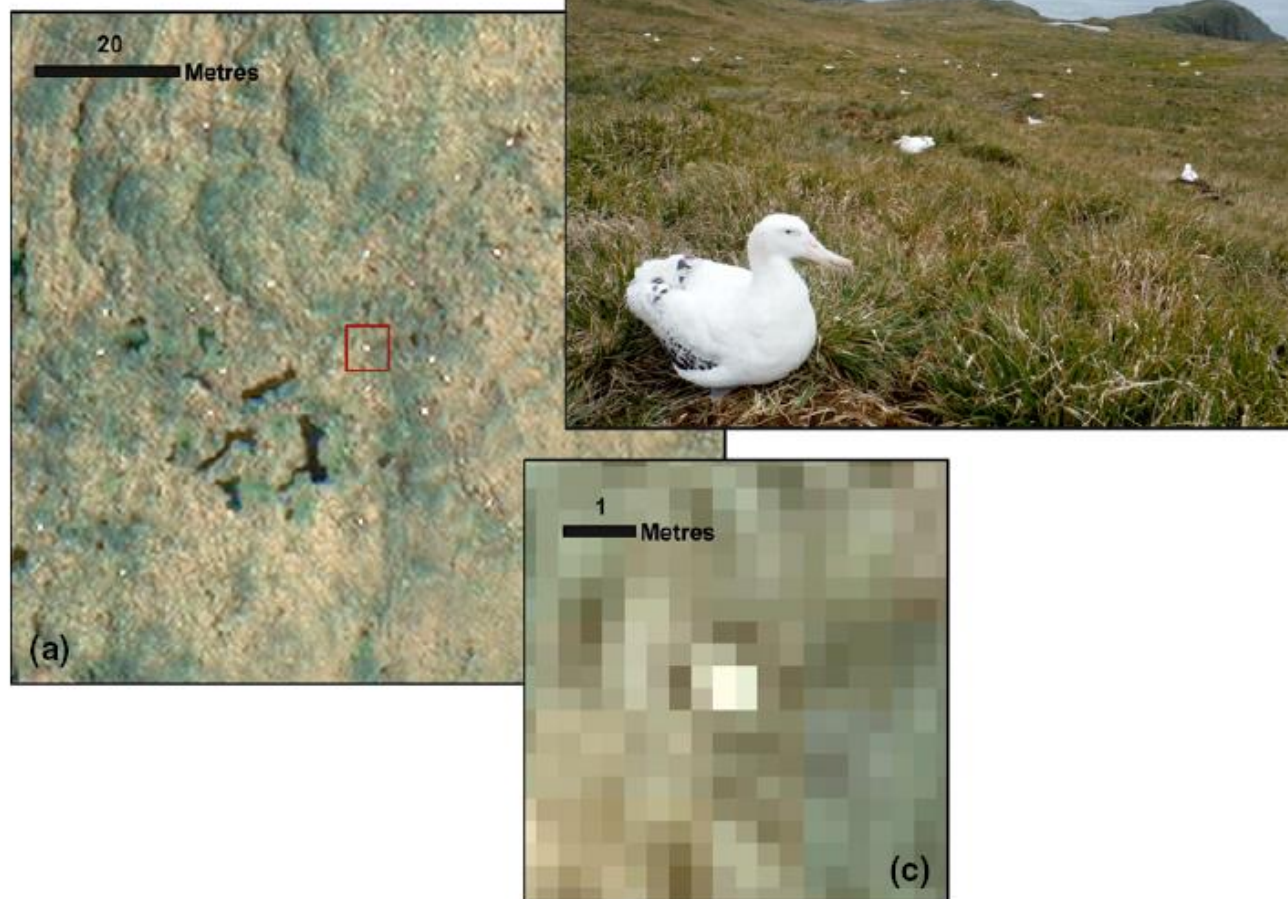


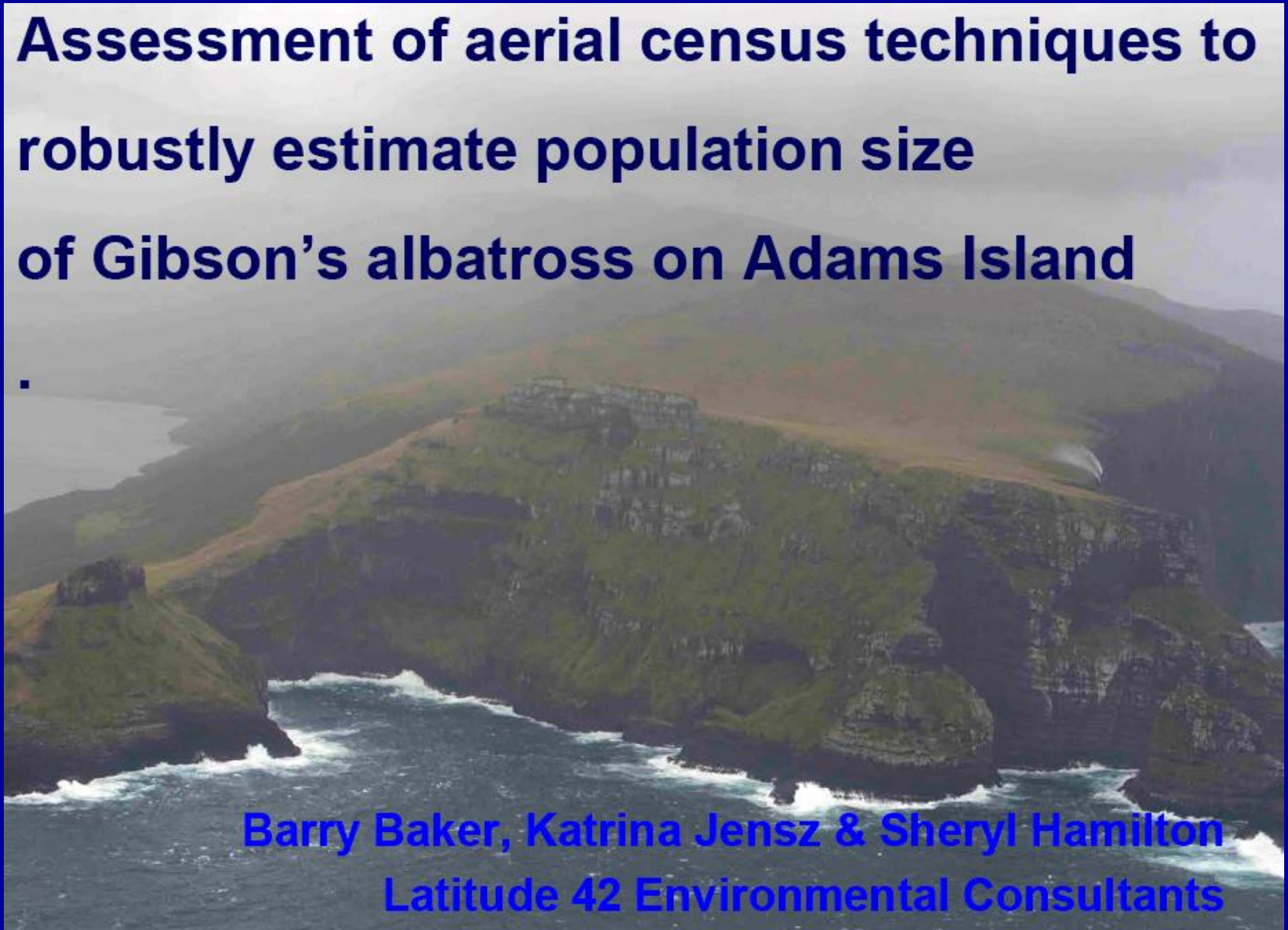
Figure 2. (a) Part of the WorldView-3 satellite image of Bird Island showing the distribution of white dots. (b) Photograph of Island for comparison (photo credit: R.A. Phillips). (c) Close-up of a representative white dot in (a), indicating pixel composition.

Imagens aéreas para censo /avaliação populacional

Assessment of aerial census techniques to robustly estimate population size of Gibson's albatross on Adams Island

▪

Barry Baker, Katrina Jenz & Sheryl Hamilton
Latitude 42 Environmental Consultants



Imagens aéreas



Gibson's albatross nesting birds (left panel)
with an extreme crop (right panel).



Gibson's albatross nesting birds (left panel)
with an extreme crop (right panel).



RESUMINDO:

O método de registro de dados (documentação) por meio de fotografias é muito mais vantajoso do que apenas observação visual.

Mas, lógico, sempre vai depender de seus objetivos e do detalhamento de informações necessário à sua pesquisa!