

Phylogeny and Revision of the Rove Beetle Genus *Phlaeopterus* Motschulsky, 1853

(Coleoptera: Staphylinidae: Omaliinae: Anthophagini)

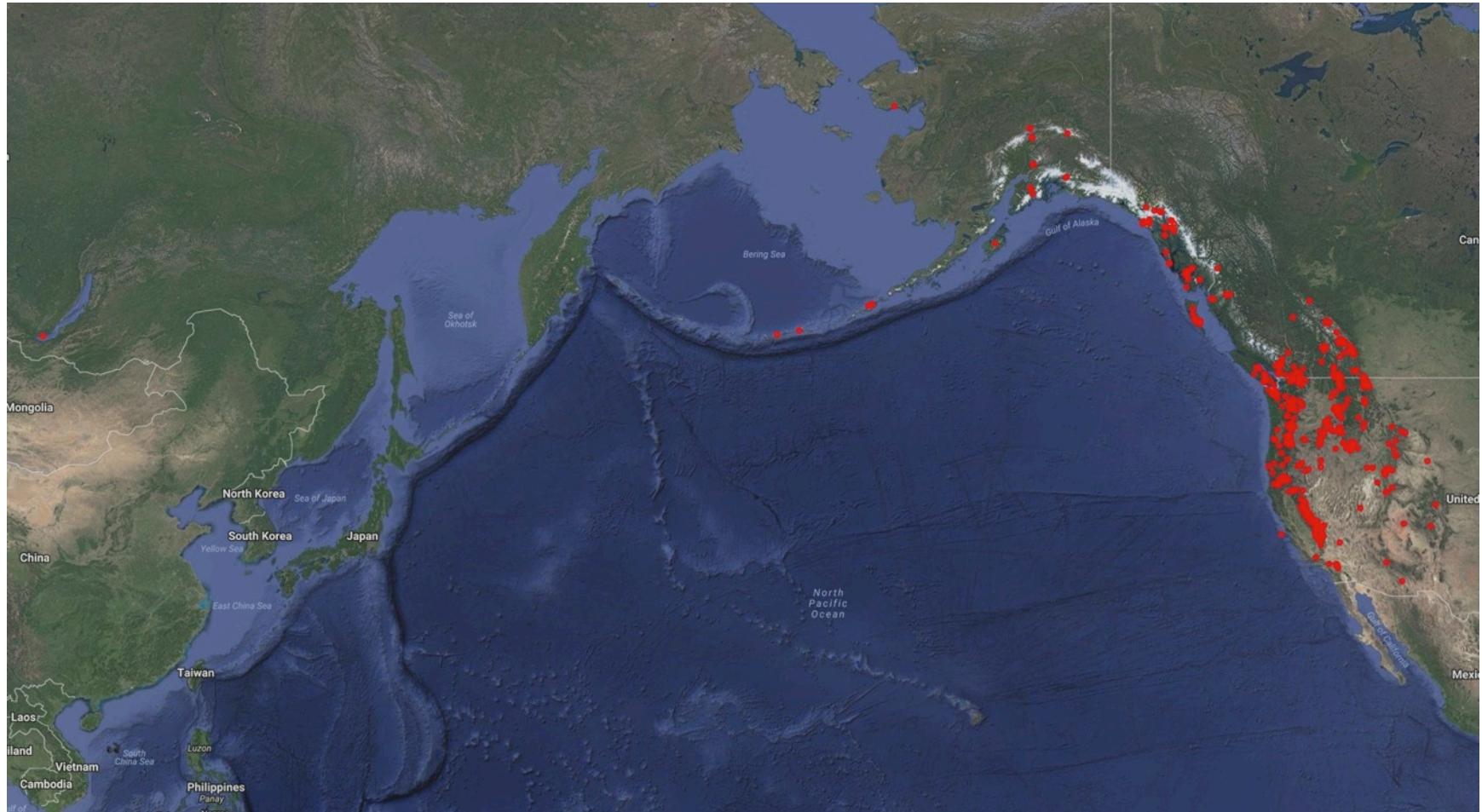


Logan Mullen

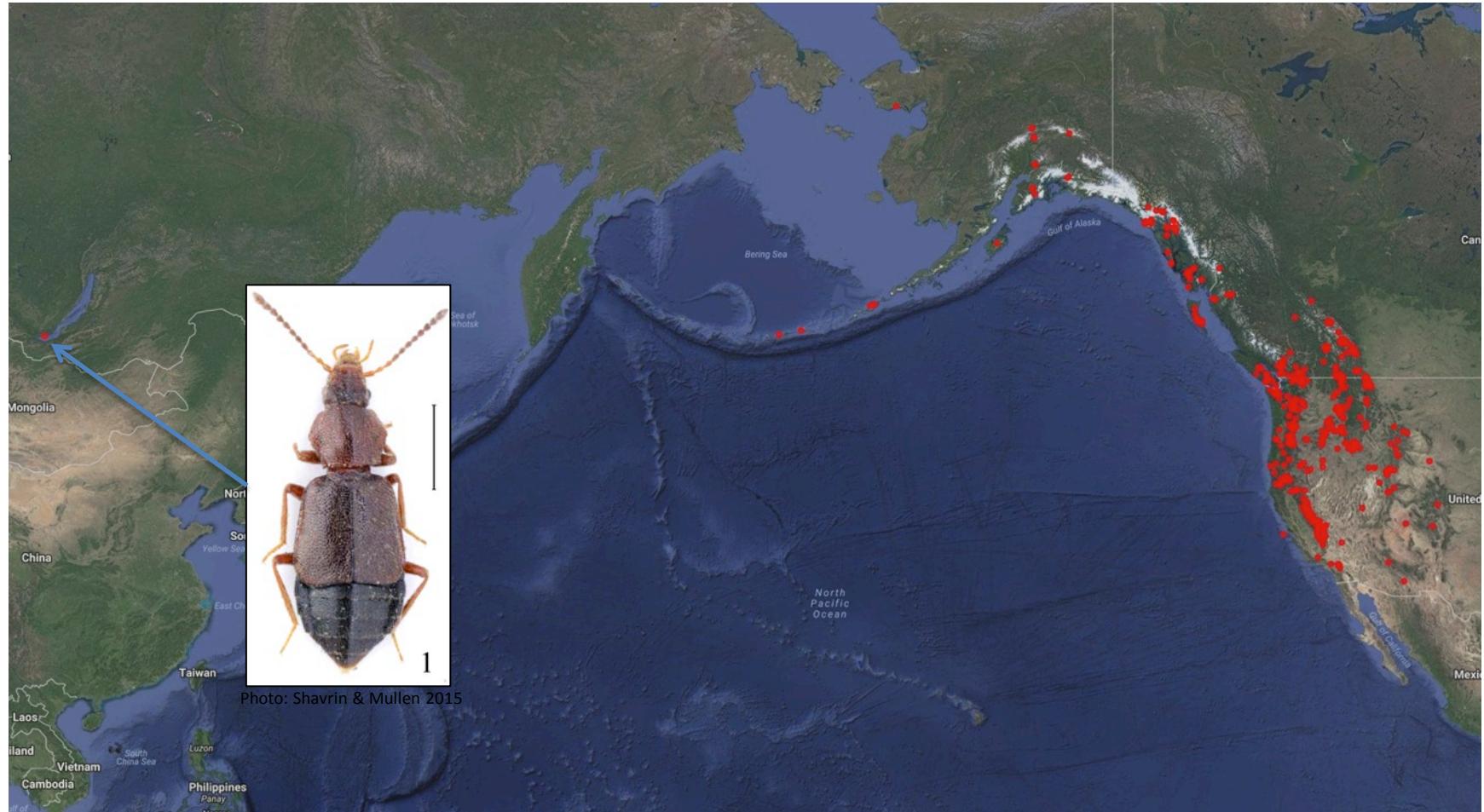
MS Student

University of Alaska Museum

Background: distribution



Background: distribution



Background: distribution



402

Coleopterological Notices, V.

TILEA Fauvel.

Phlaeopterus Mots. i. litt. ; *Phlaeopterus* Csy., olim.

This is the most conspicuous of the endemic North American genera of Omalini, although probably occurring also in Siberia; I believe there is no record of its having been taken there, however.



Photo: Shavrin & Mullen 2015

Background: habitat



Photo: D.S. Sikes

Background: habitat



Background: habitat



Background: climate change threat



Background: climate change threat

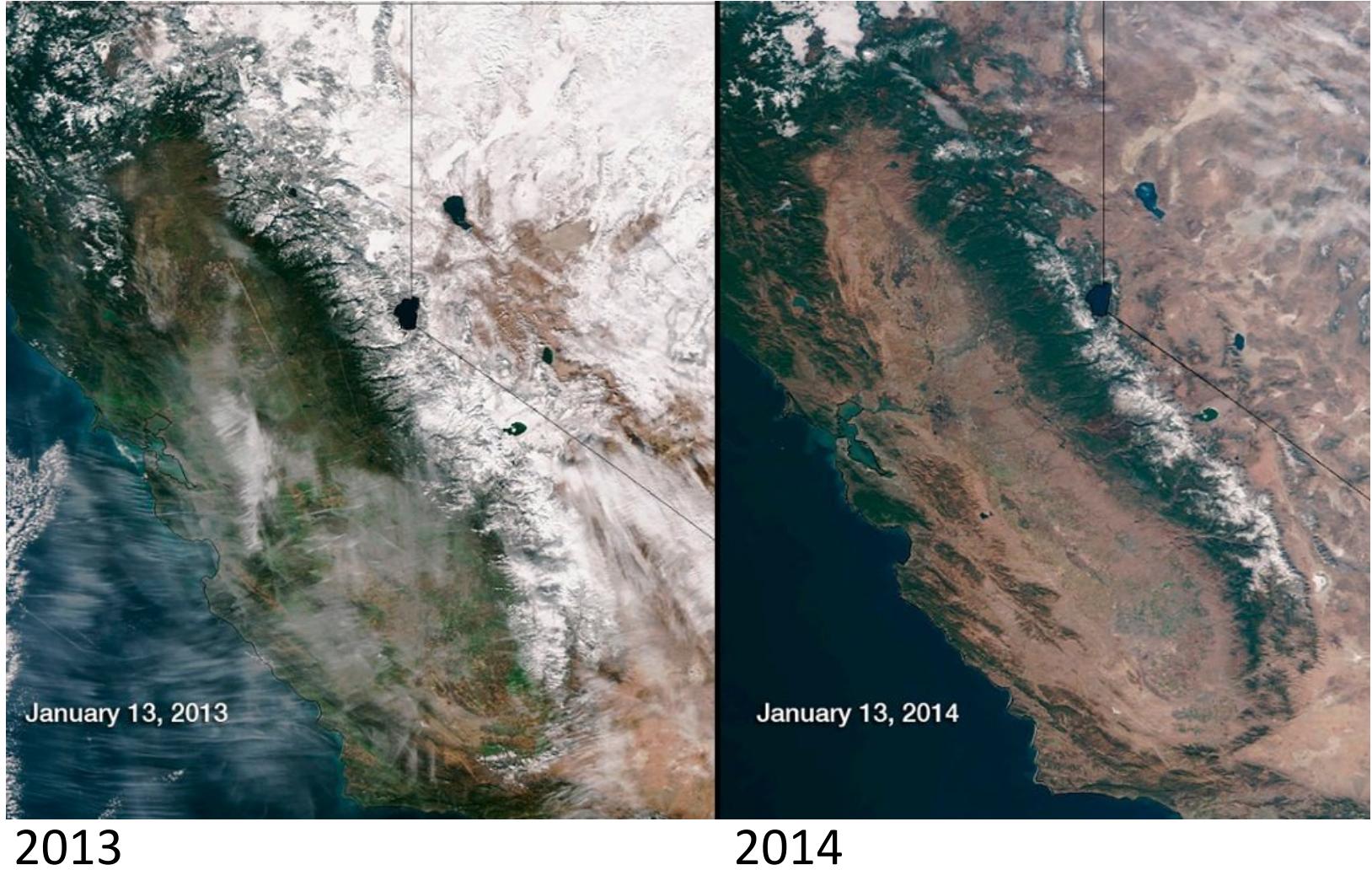
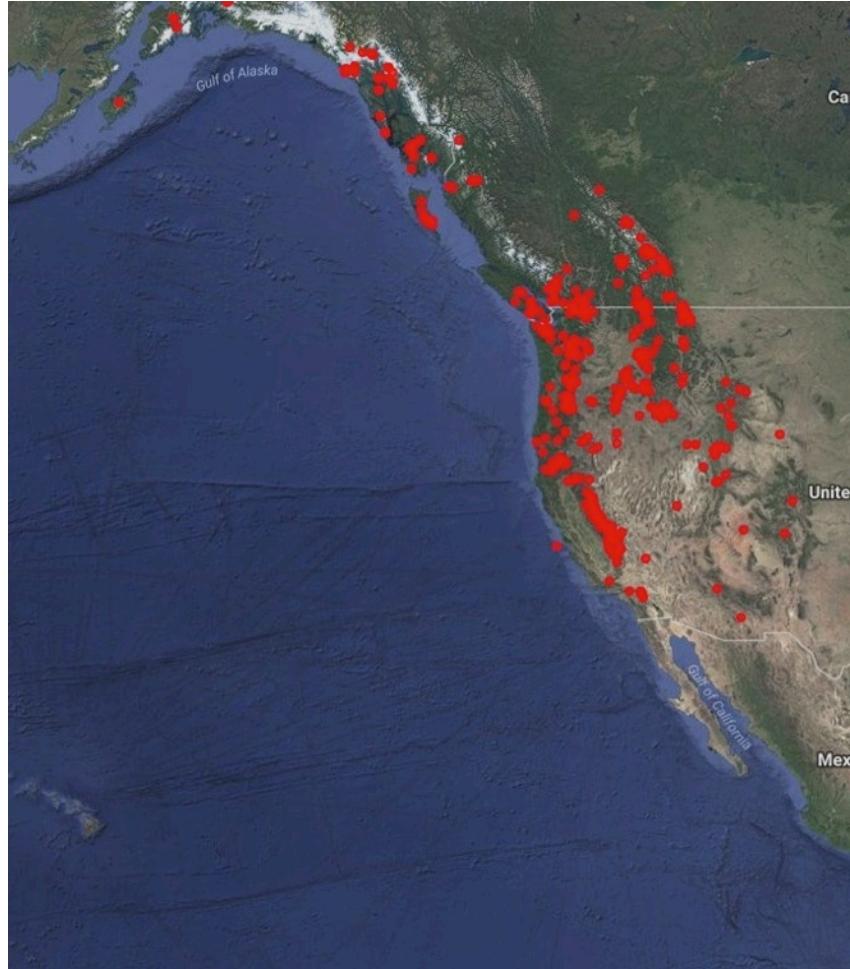
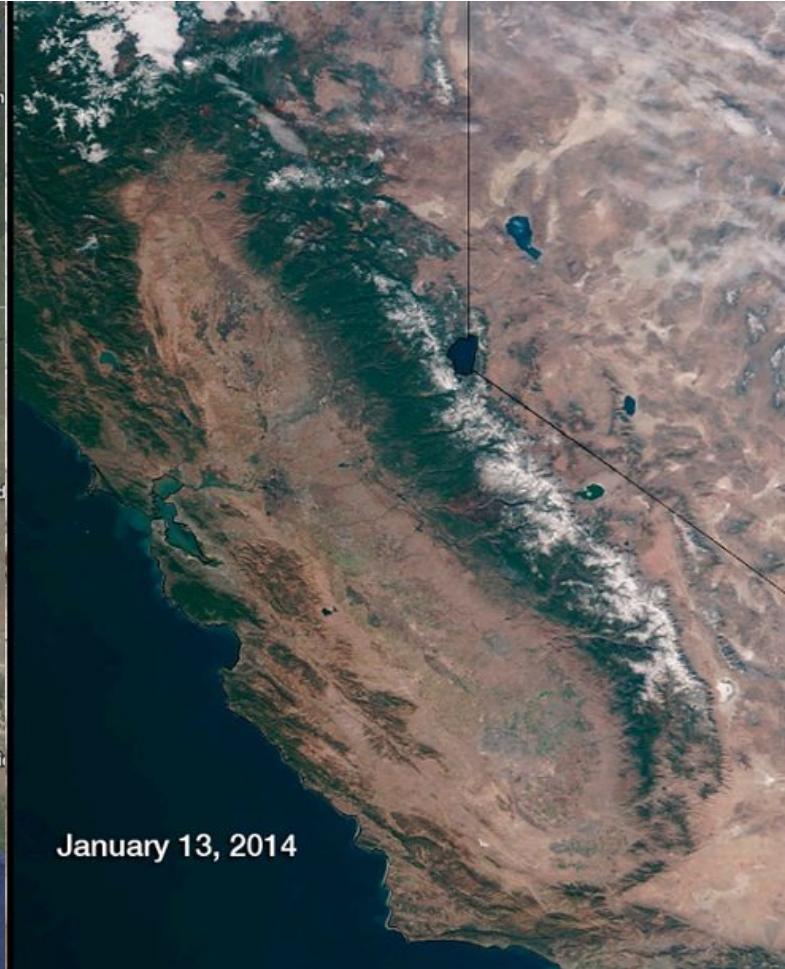


Photo: NASA

Background: climate change threat



2013



2014

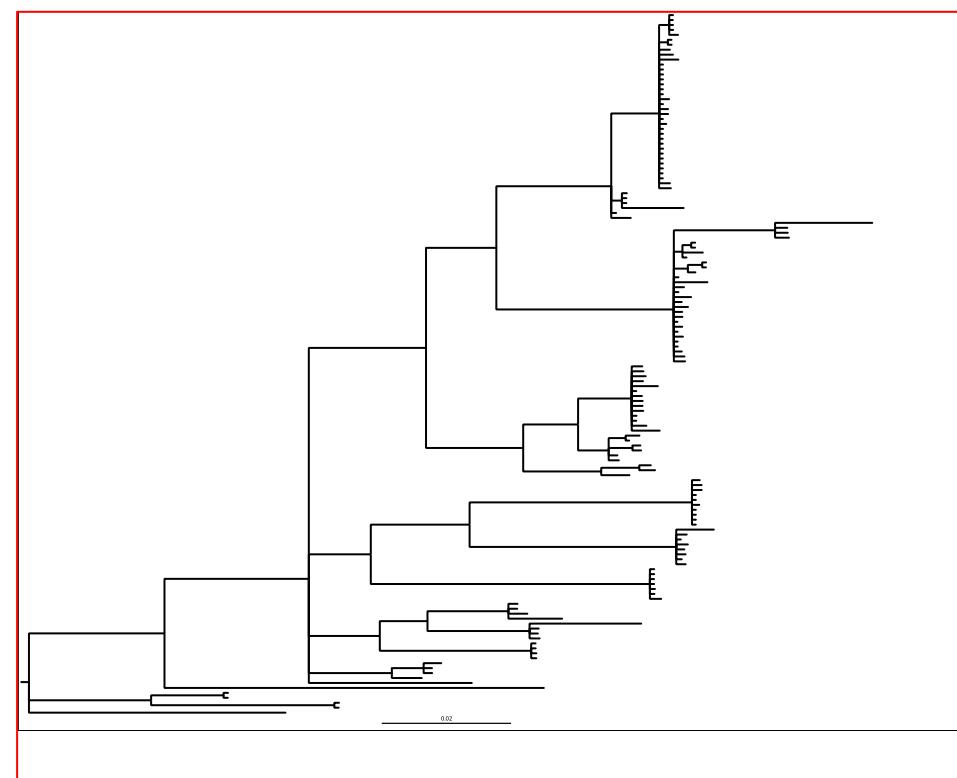
Photo: NASA

The chicken and the egg

Taxonomic Revision

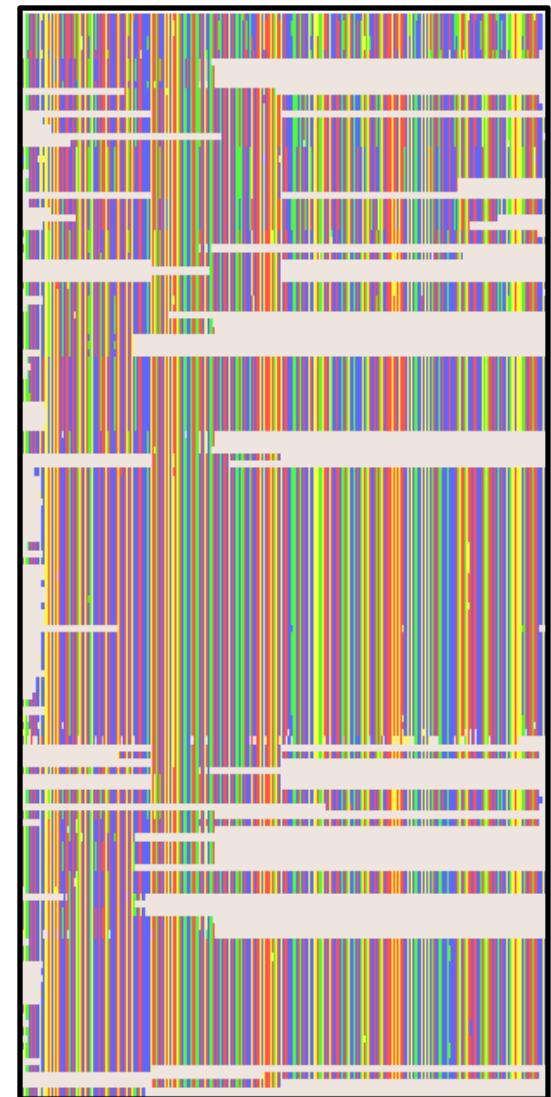


Phylogeny

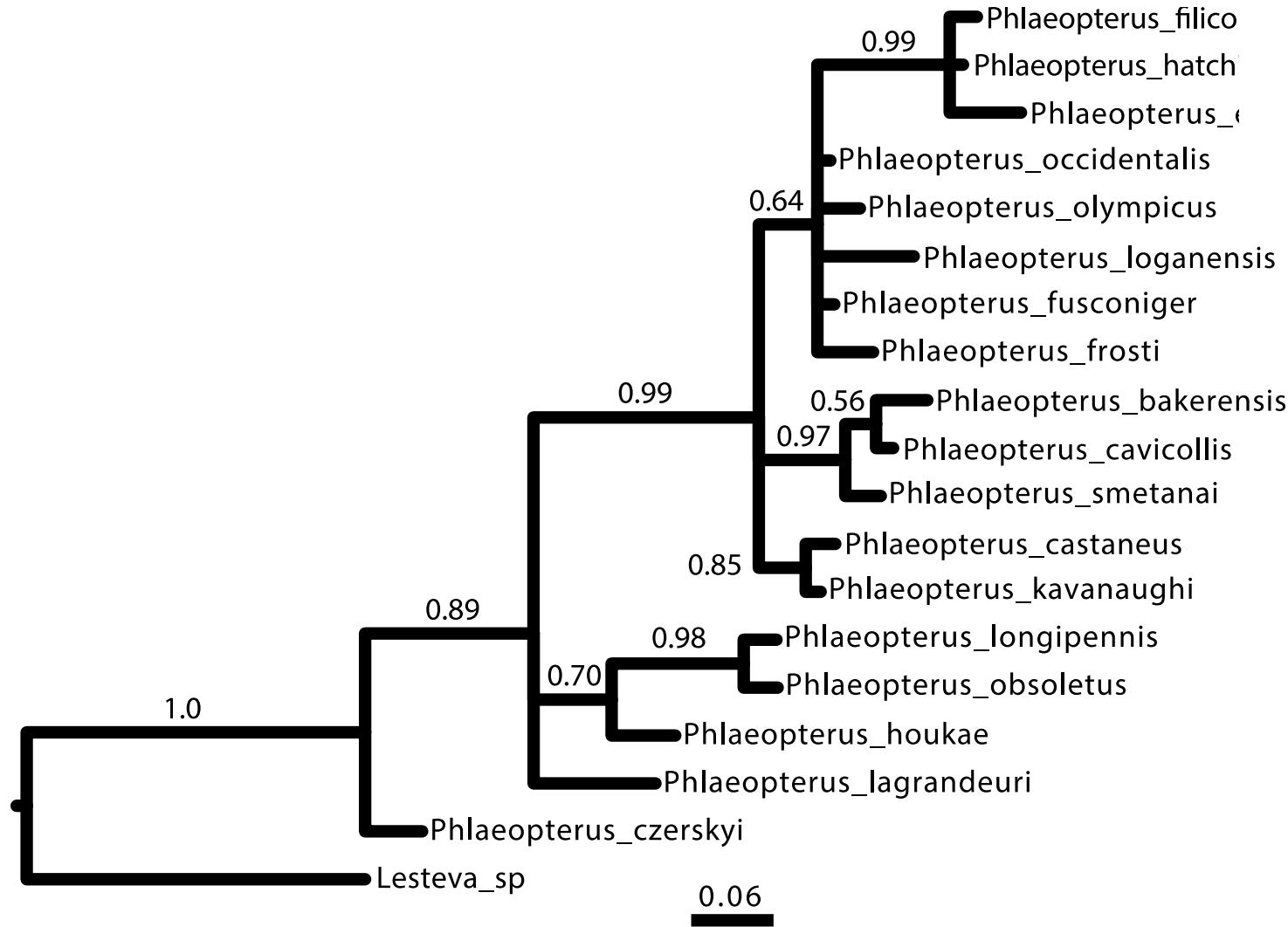


Phylogenetic data

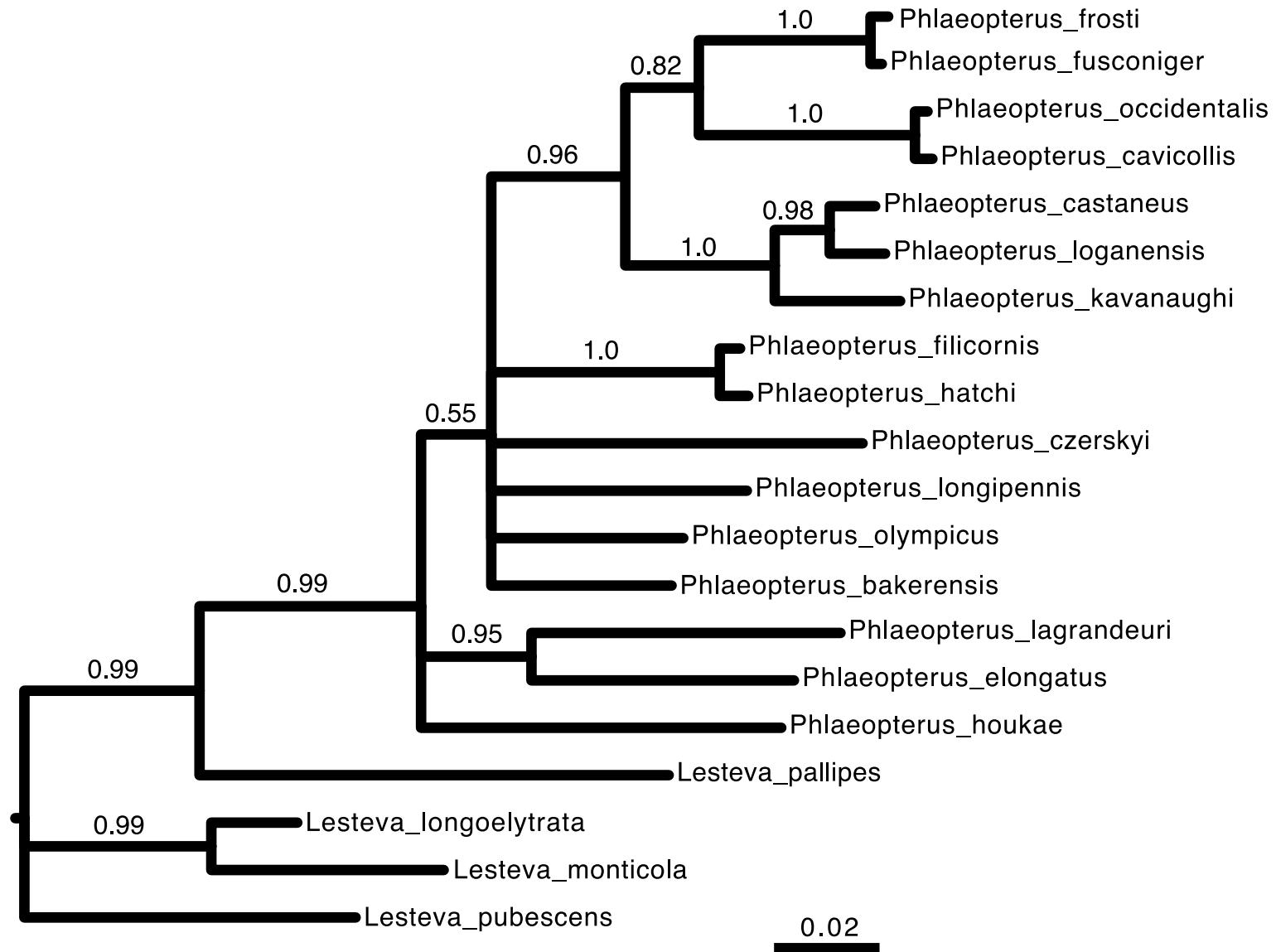
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48			
<i>Lesteva sp.</i>	0	0	0	0	0	0	0	0	0	1	0	0	?	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>P. czerskyi</i>	0	0	2	1	2	0	1	?	?	1	1	0	?	?	0	1	1	0	0	1	2	1	0	1	1	2	2	0	0	1	0	0	0	2	1	1	1	0	0	0	1	2	1	0	0	1	1	1	1		
<i>P. lagrandeuri</i>	0	0	3	1	1	2	1	1	1	1	1	0	1	1	0	0	1	2	1	0	1	1	2	2	2	1	1	0	1	0	0	1	1	2	1	1	0	0	1	0	2	1	0	0	1	2					
<i>P. haukae</i>	0	0	2	1	1	2	1	1	1	1	1	0	1	1	0	1	2	0	0	1	3	3	0	1	2	2	2	1	1	0	1	0	1	?	1	1	1	1	0	0	0	1	0	1	1	2	0	0	7		
<i>P. longipennis</i>	0	0	2	1	1	1	1	1	1	1	1	0	1	1	0	2	2	1	0	1	2	3	0	1	1	2	1	1	0	1	0	0	0	1	1	1	1	0	0	0	1	0	1	1	1	0	2				
<i>P. obsoletus</i>	0	0	2	1	1	1	1	1	1	1	0	1	1	0	2	2	1	0	1	2	3	1	1	2	1	1	0	1	0	0	3	1	1	1	1	0	0	0	1	0	1	1	3	0	0	2					
<i>P. filicornis</i>	1	1	2	1	2	1	2	1	1	1	1	0	1	1	1	1	0	0	1	2	1	0	0	2	1	1	0	1	0	1	0	1	3	1	1	1	1	0	1	0	1	0	1	0	1	2	0	0	1		
<i>P. hatchi</i>	1	1	2	1	2	1	2	1	1	1	1	0	1	1	1	1	0	0	1	2	1	0	0	1	1	1	0	1	0	1	0	3	1	1	1	1	0	1	0	1	0	1	0	1	0	1	2	0	0	1	
<i>P. elongatus</i>	1	1	2	1	2	1	2	1	1	1	0	1	1	1	1	0	0	1	2	3	0	0	1	1	1	0	1	0	1	0	3	1	1	1	1	0	1	0	1	1	1	0	1	0	0	0	1				
<i>P. castaneus</i>	1	2	2	1	2	1	2	1	1	1	1	0	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	1	0	3	1	1	1	1	0	0	0	1	0	1	0	1	0	1	1	0	1		
<i>P. kavanaughi</i>	1	2	2	1	2	1	2	1	1	1	1	0	1	1	1	1	0	0	1	2	1	1	1	3	1	2	1	1	0	1	0	3	1	1	1	1	0	0	0	1	0	1	0	1	0	1	0	1			
<i>P. bakerensis</i>	2	4	2	1	2	1	2	1	1	2	0	1	1	1	1	0	0	1	2	1	0	1	3	3	1	2	1	1	1	1	0	3	1	1	1	1	0	3	0	1	0	1	0	1	0	0	0	1			
<i>P. cavicollis</i>	2	4	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	1	3	3	1	2	1	1	0	1	0	3	1	1	1	1	0	3	0	1	0	1	0	1	0	0	1			
<i>P. smetanai</i>	2	4	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	2	3	1	2	1	1	0	1	0	3	1	1	1	1	0	3	0	1	0	1	0	1	0	0	1			
<i>P. occidentalis</i>	1	3	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	1	0	3	1	1	1	1	0	2	0	1	0	1	0	1	2	0	1			
<i>P. olympicus</i>	1	3	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	1	0	3	1	1	3	1	0	2	0	1	0	1	0	2	2	0	1			
<i>P. koganiensis</i>	1	3	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	3	1	1	3	1	0	2	0	1	1	1	0	1	0	1	0	1	0	1		
<i>P. fusconiger</i>	1	3	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	1	0	3	1	1	1	1	0	2	0	1	0	1	0	1	2	0	0	1		
<i>P. frosti</i>	1	3	2	1	2	1	2	1	1	1	1	0	1	1	1	1	1	0	0	1	2	1	0	1	3	1	2	1	1	0	3	0	3	1	1	1	2	0	4	0	1	0	1	0	1	2	0	0	1		



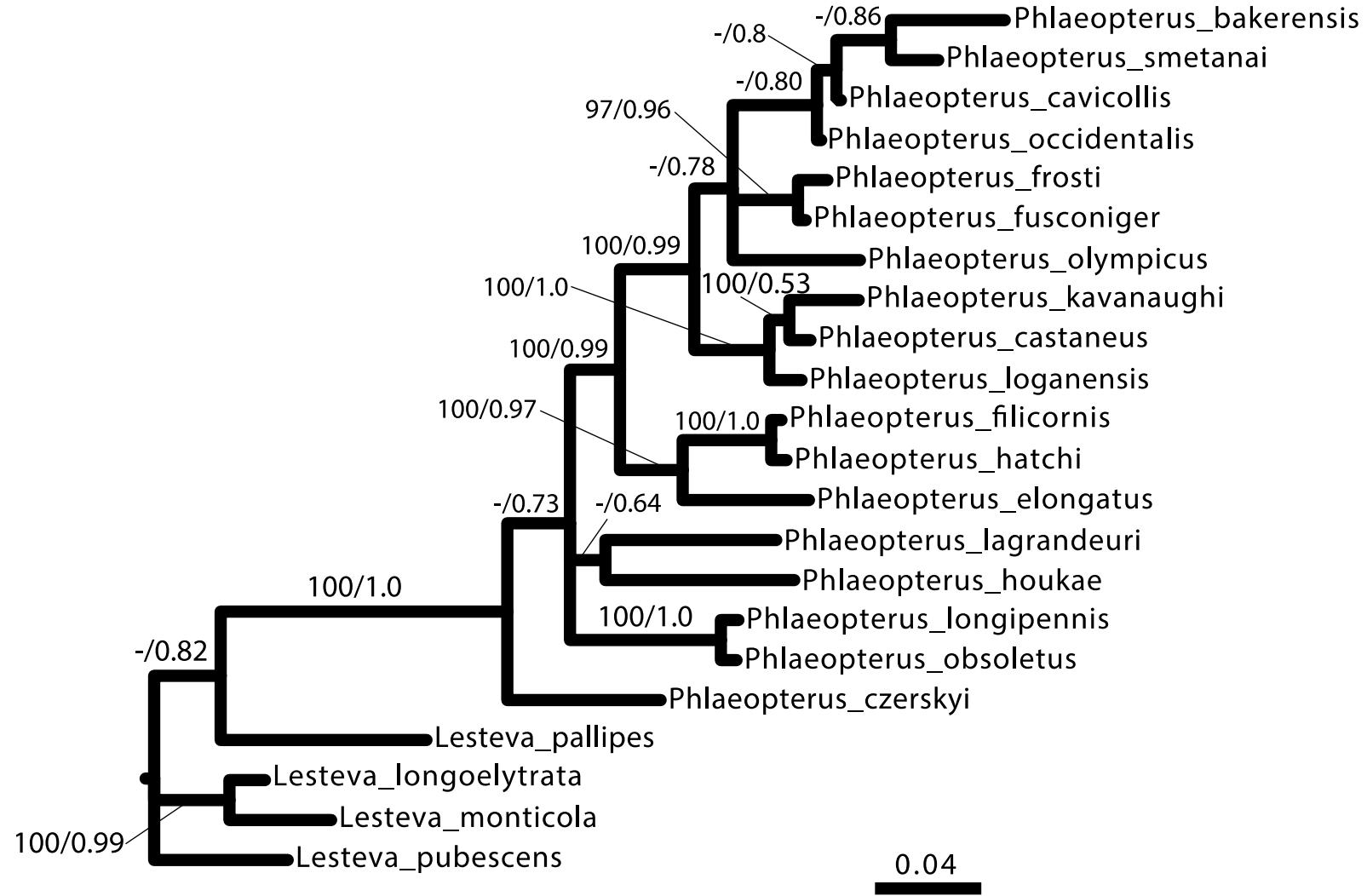
Morphological phylogeny



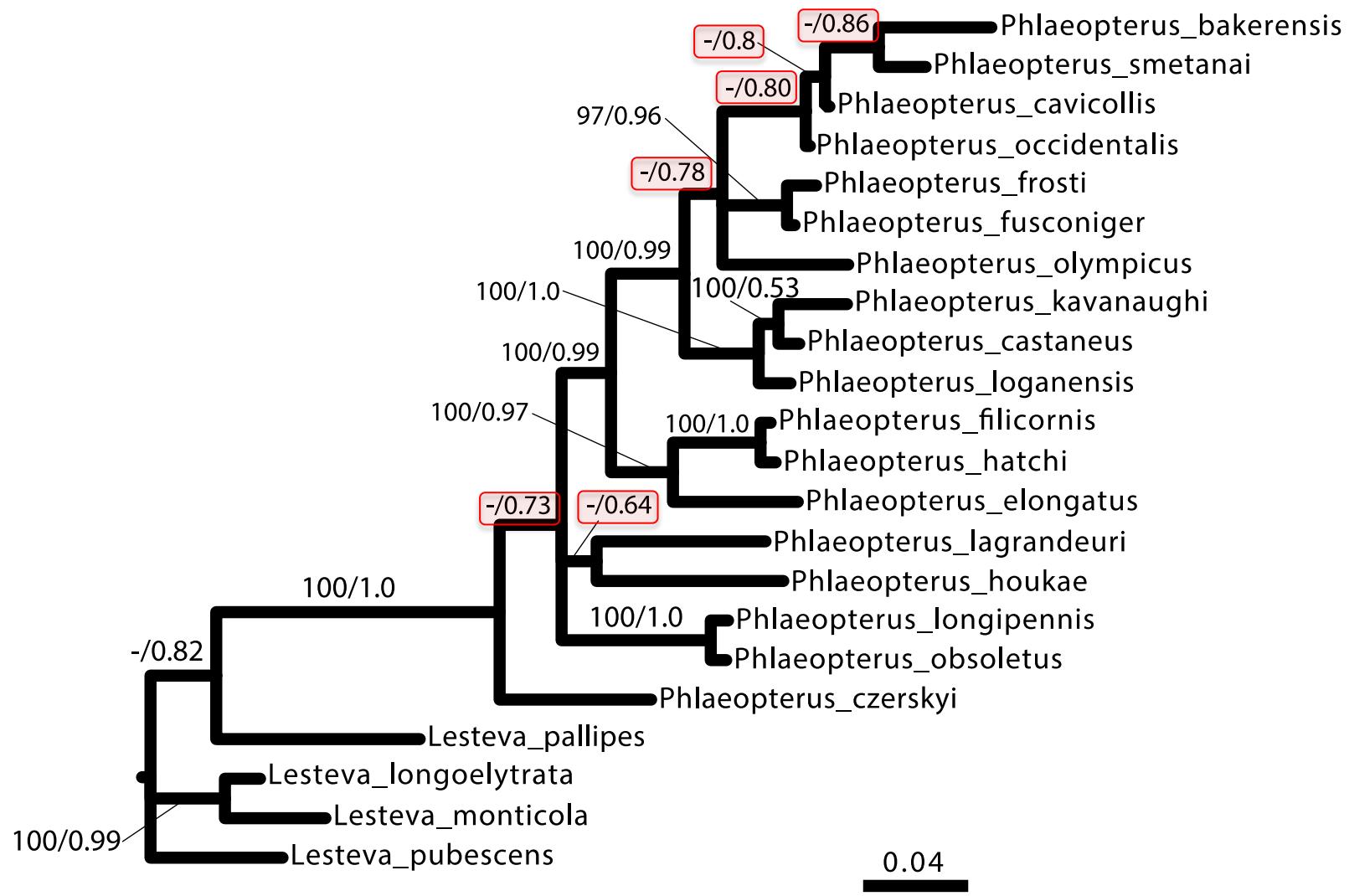
COI phylogeny



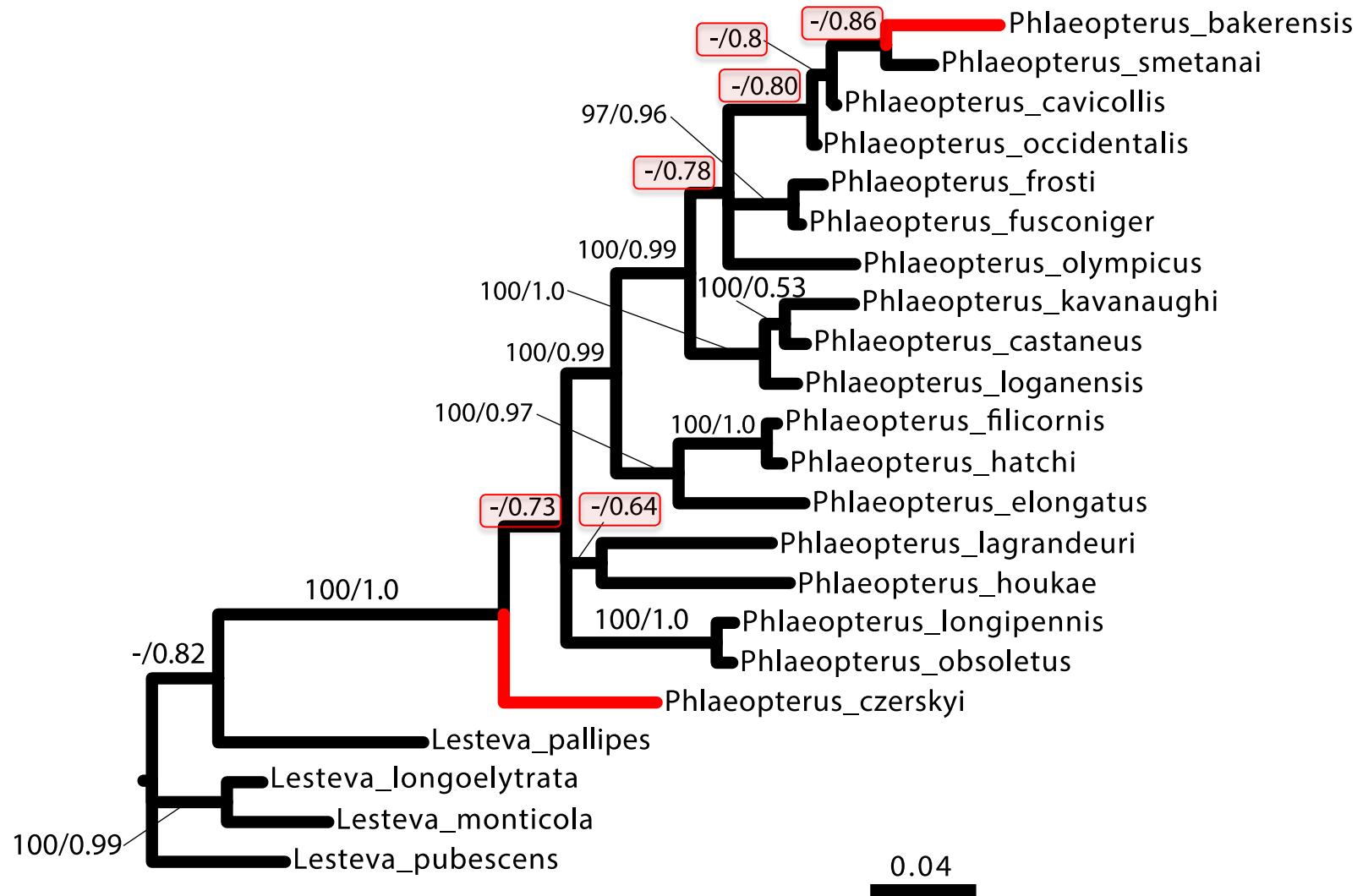
Combined morphology+COI phylogeny



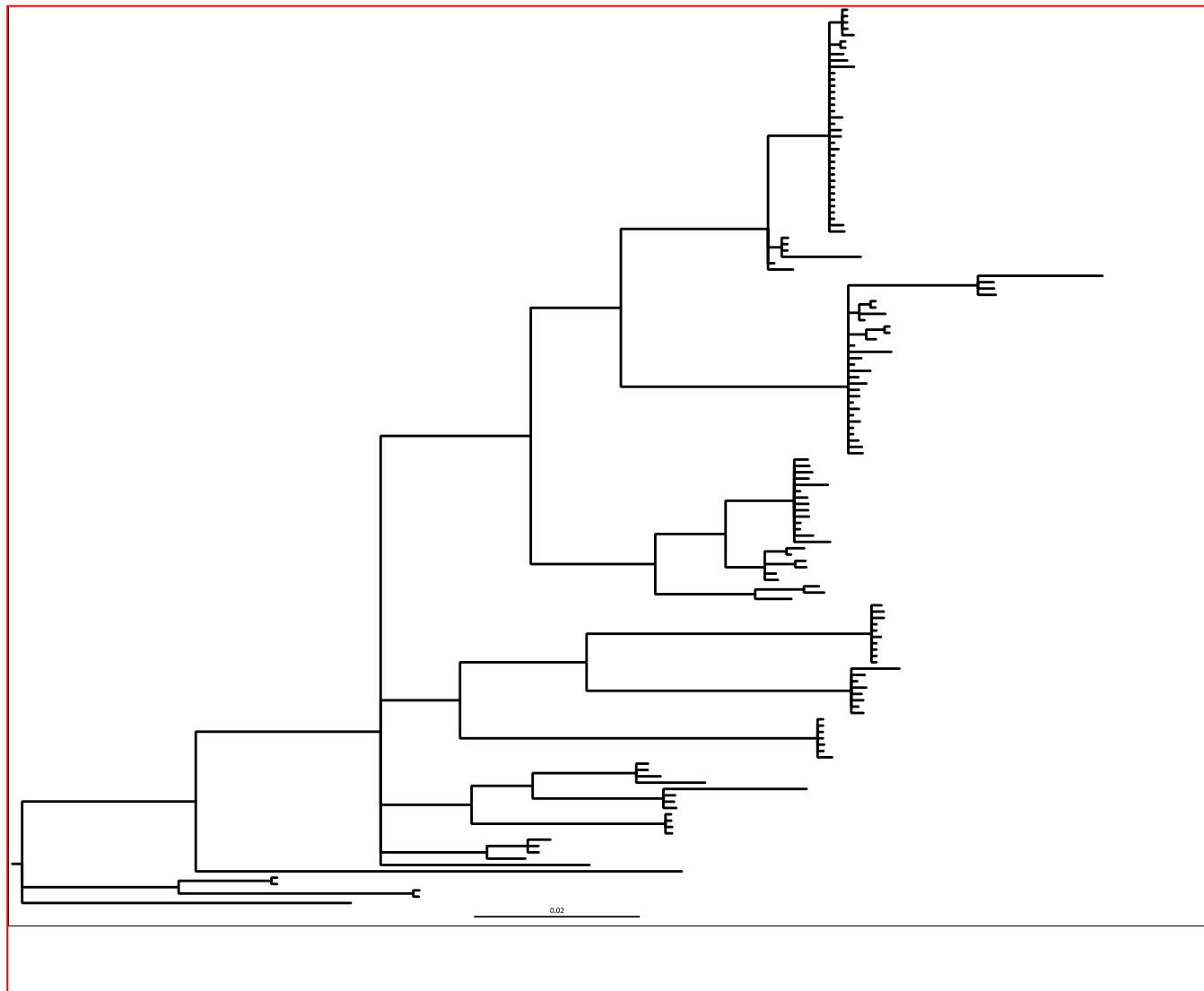
Combined morphology+COI phylogeny: disagreement



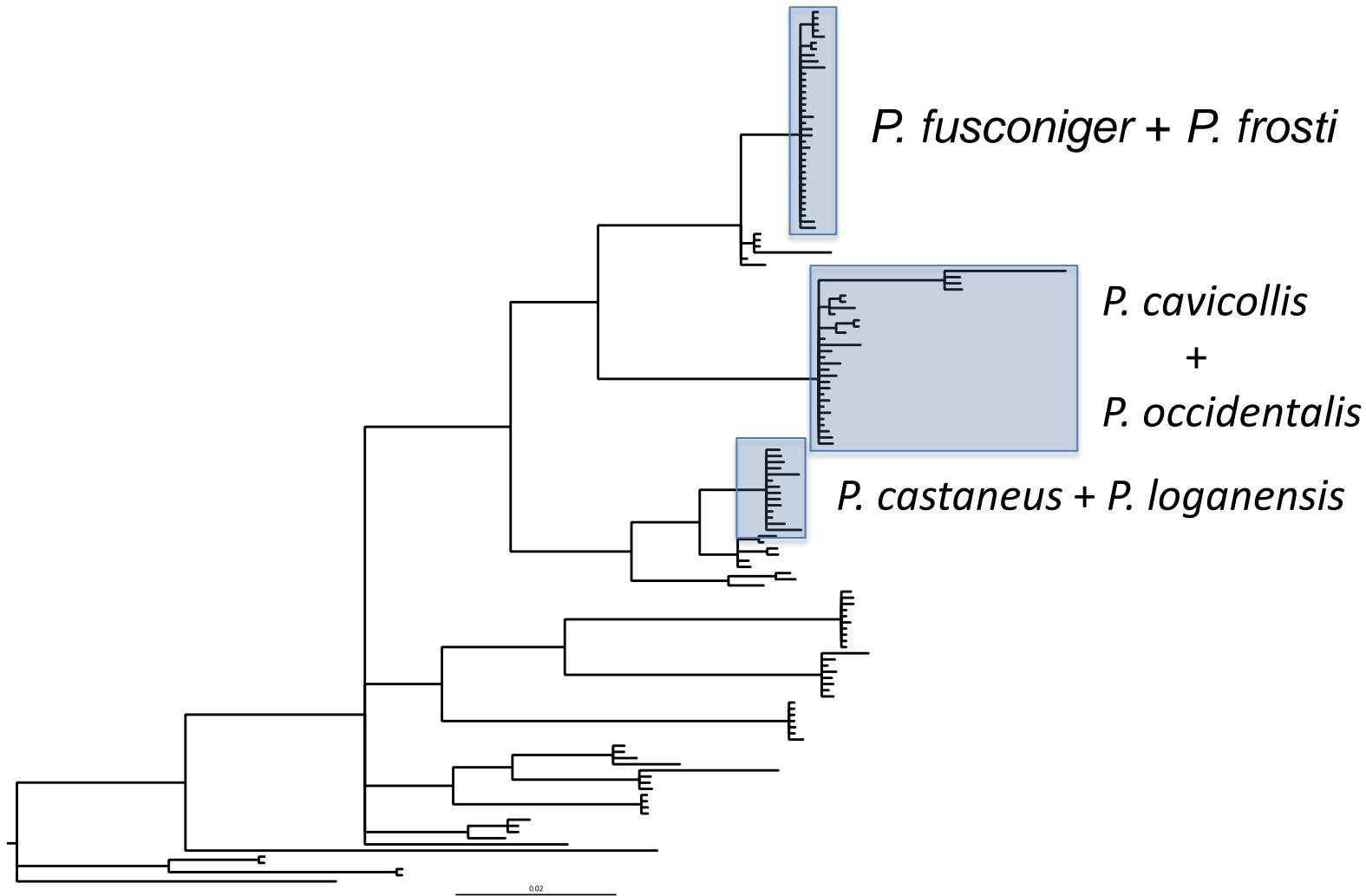
Combined morphology+COI phylogeny: rogue taxa



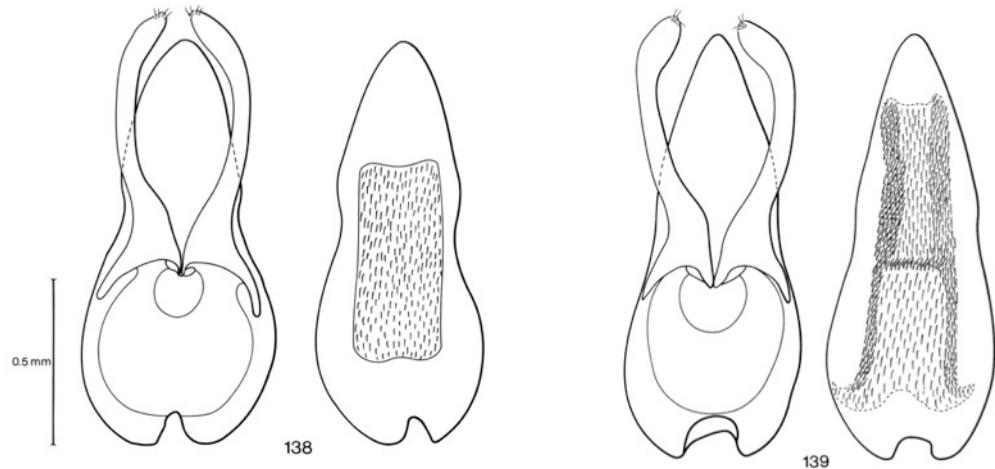
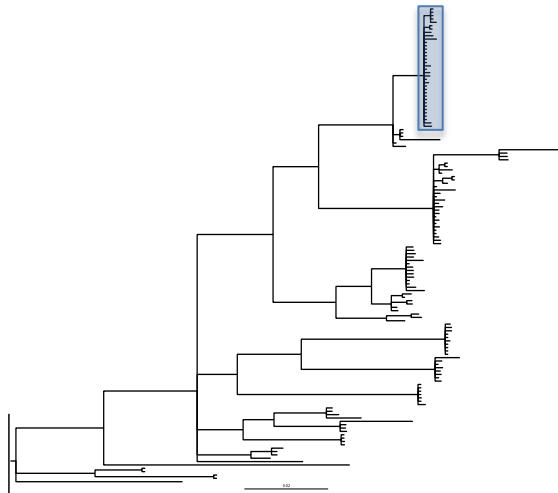
Full COI phylogeny



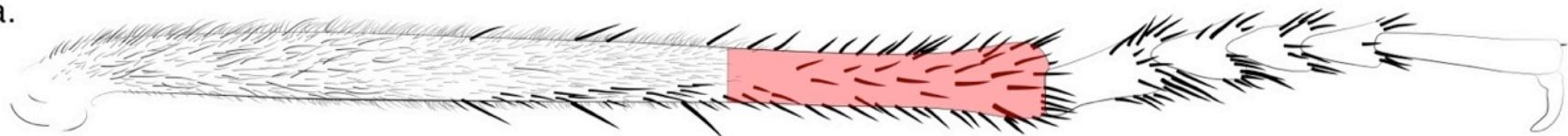
COI full phylogeny: species problems



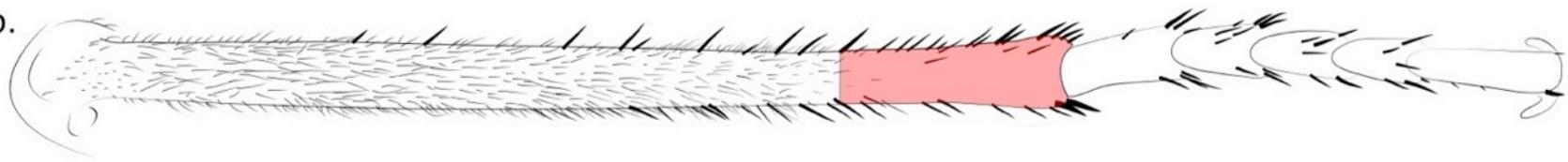
Species problems: *P. fusconiger* + *P. frosti*



a.

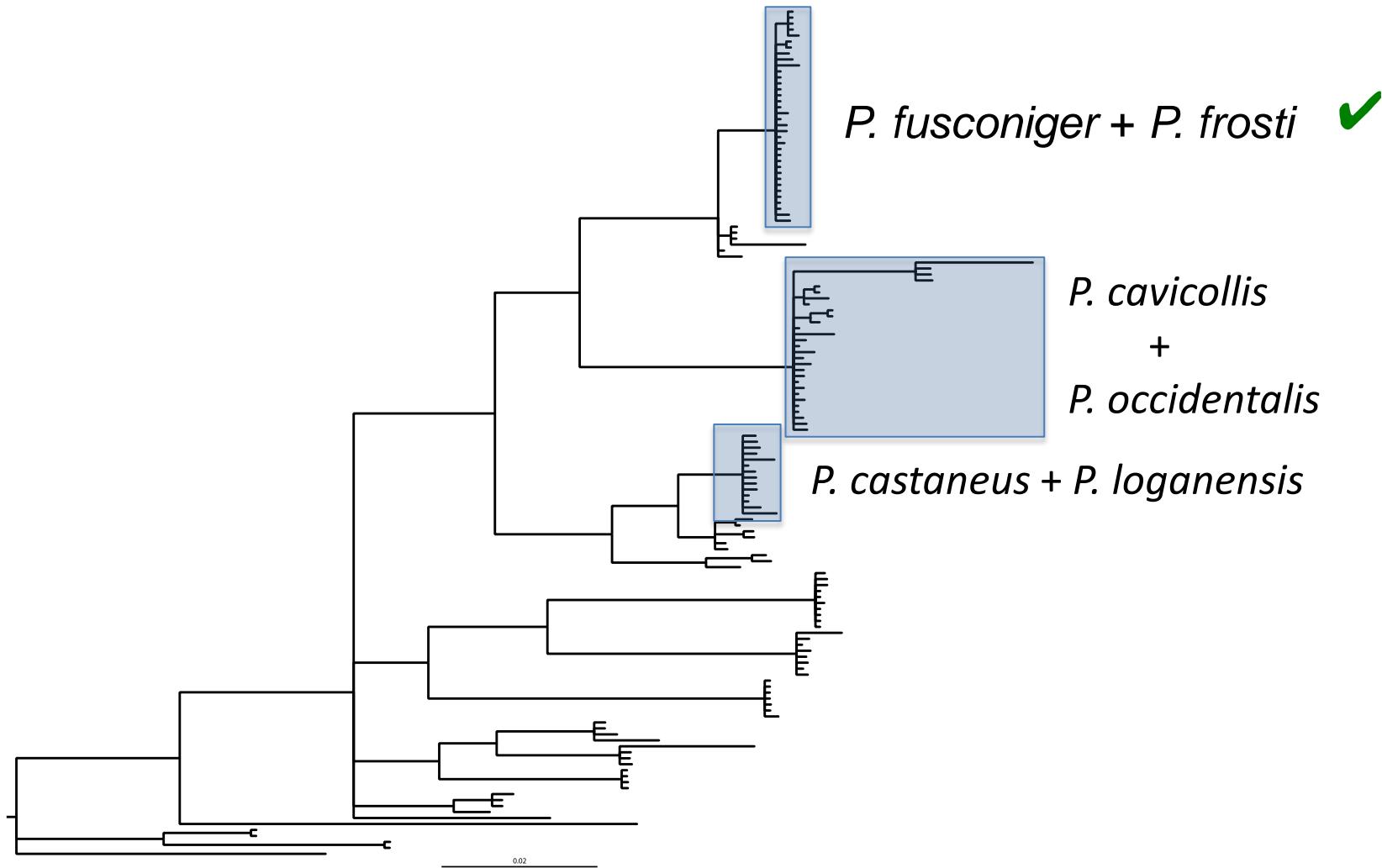


b.

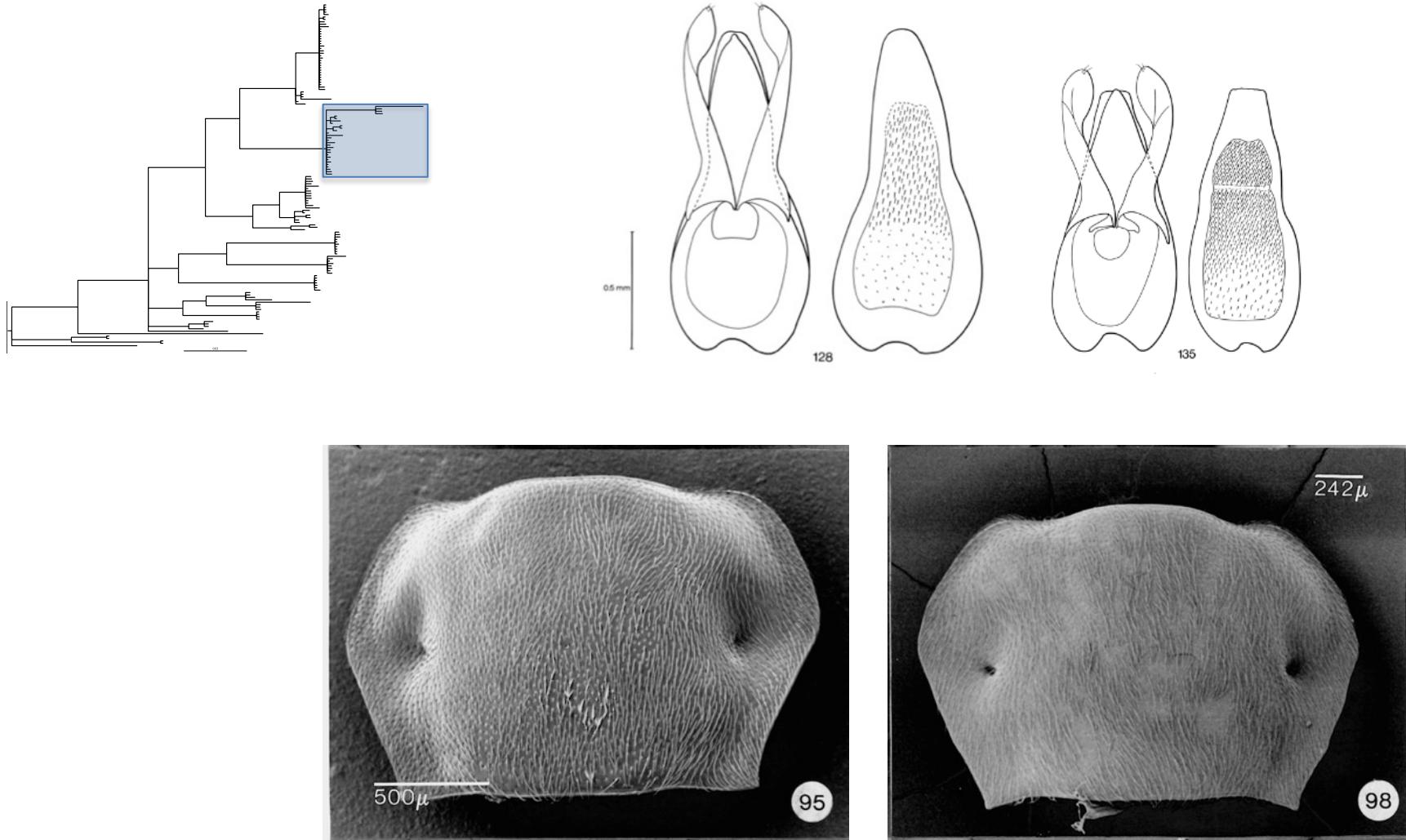


200 µm

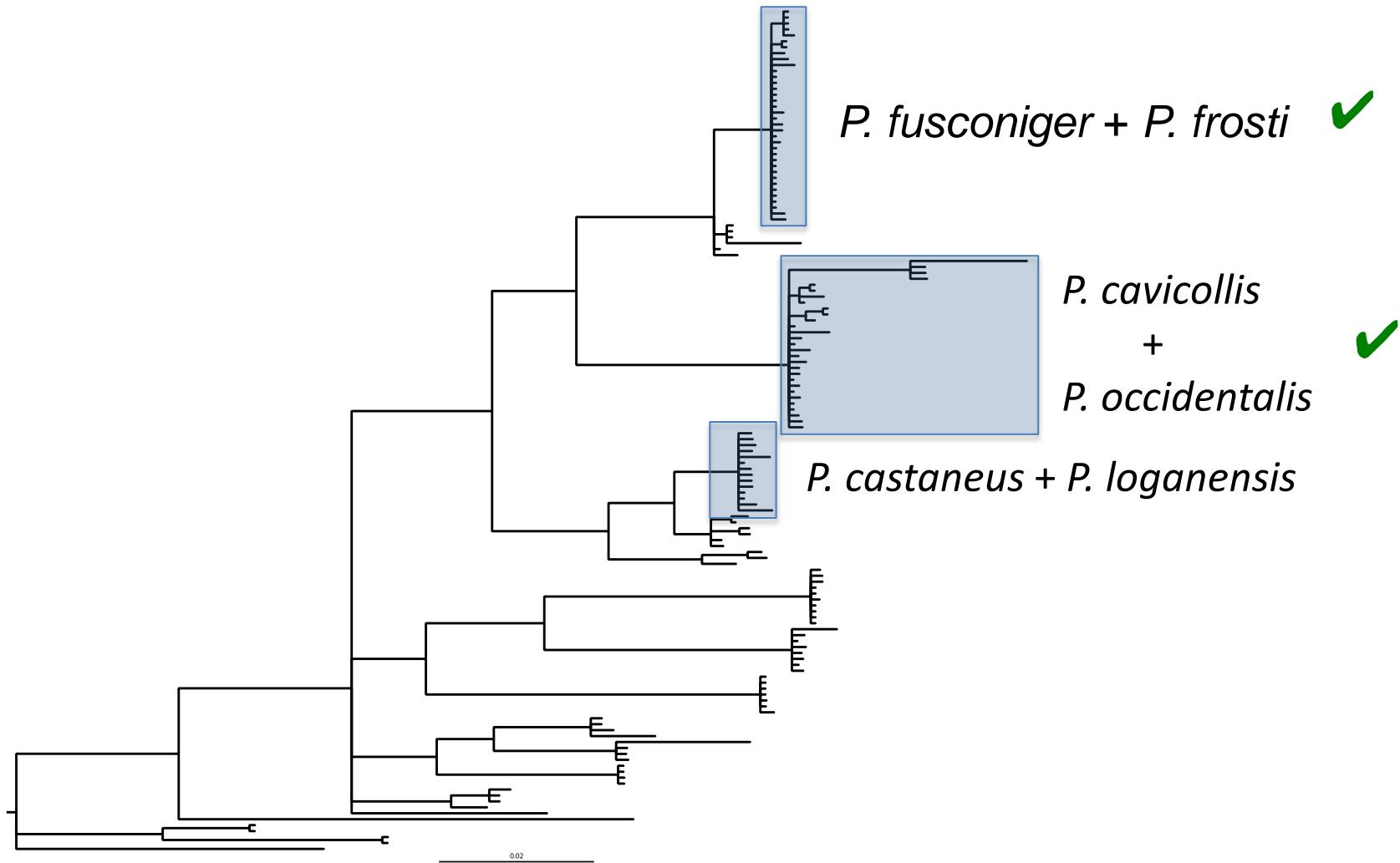
COI full phylogeny: species problems



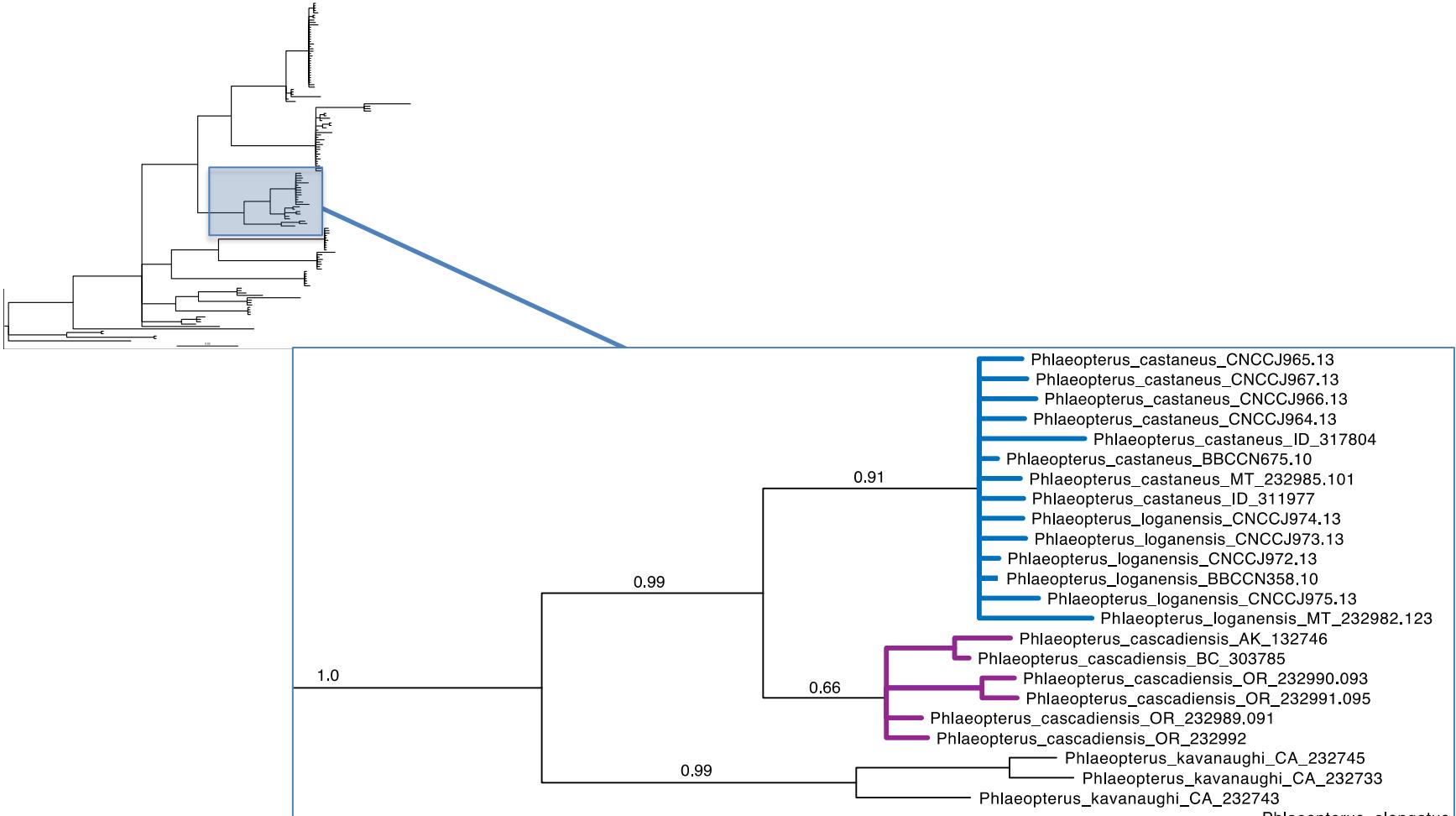
Species problems: *P. cavicollis* + *P. occidentalis*



COI full phylogeny: species problems

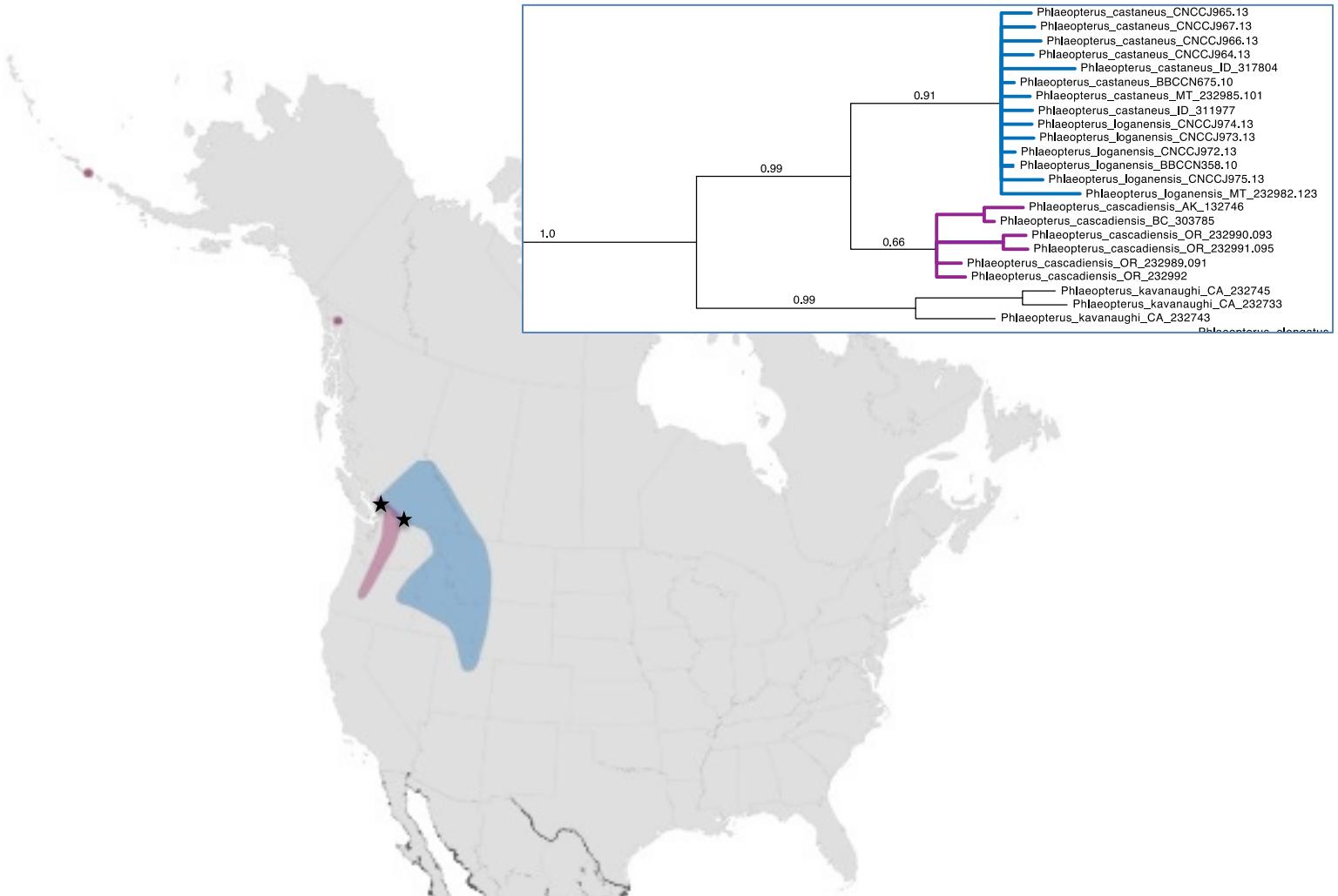


Species problems: *P. castaneus* vs. *P. loganensis*

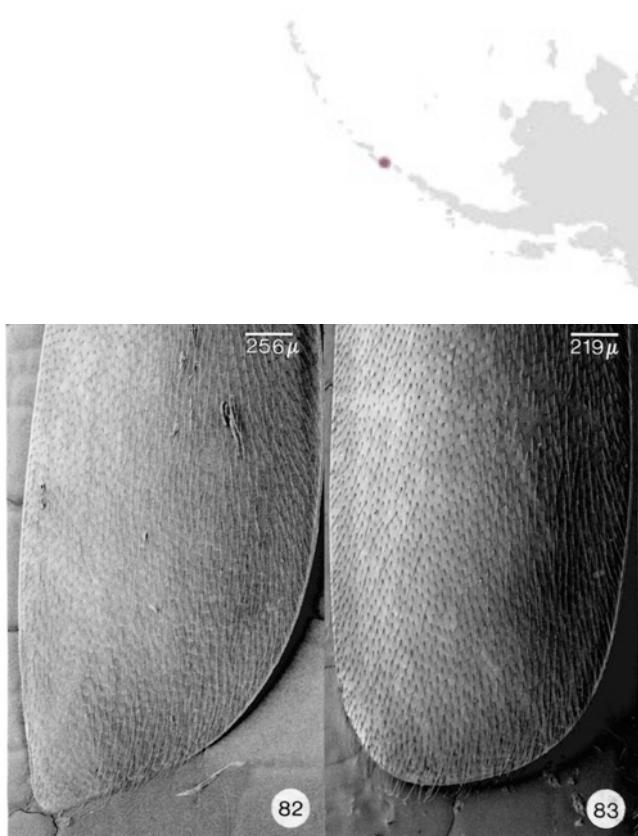


Distribution:

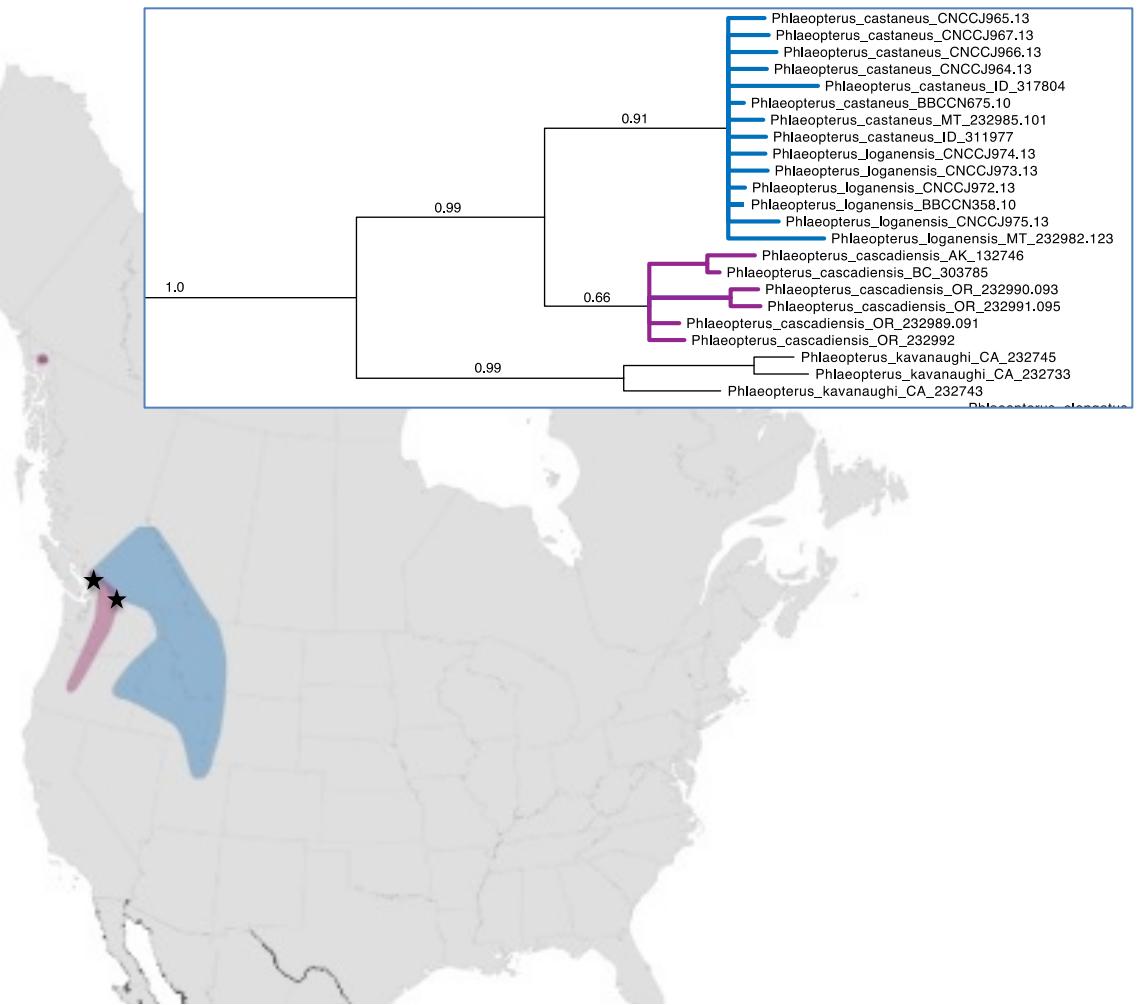
P. castaneus vs. *P. cascadiensis* vs. *P. loganensis*



Species problems: *P. castaneus* vs. *P. loganensis*



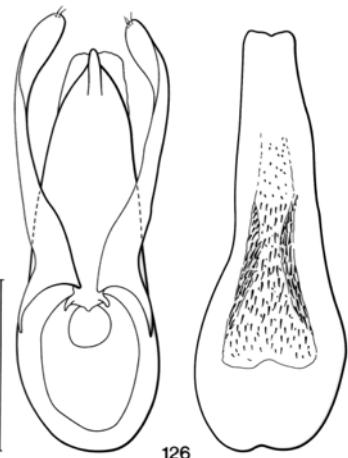
Apex of elytron



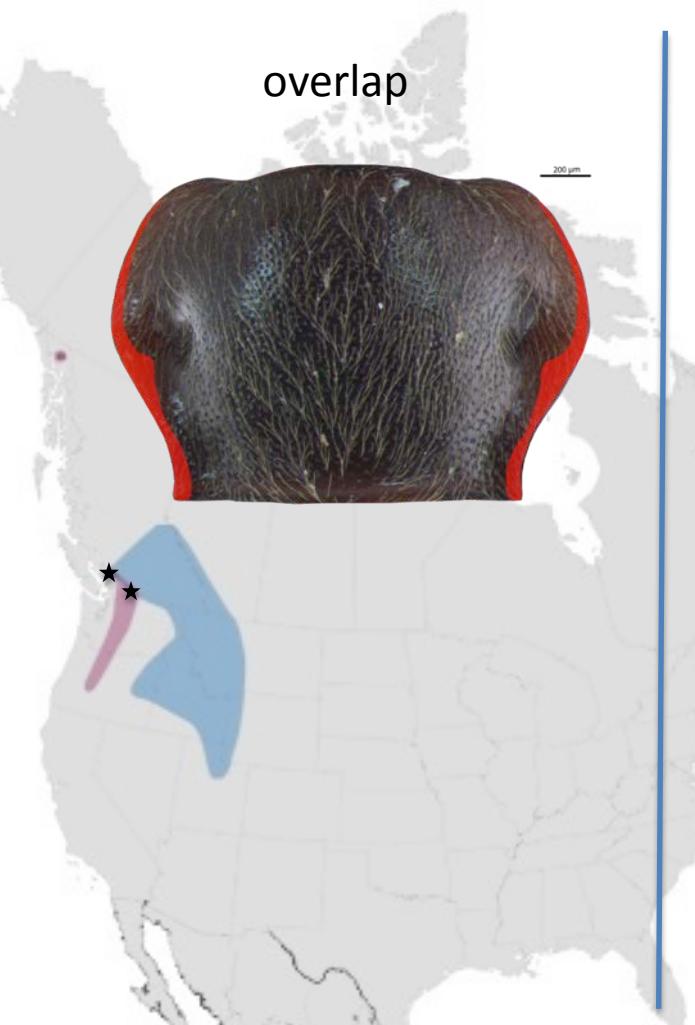
Species problems:

P. castaneus vs. *P. cascadiensis*

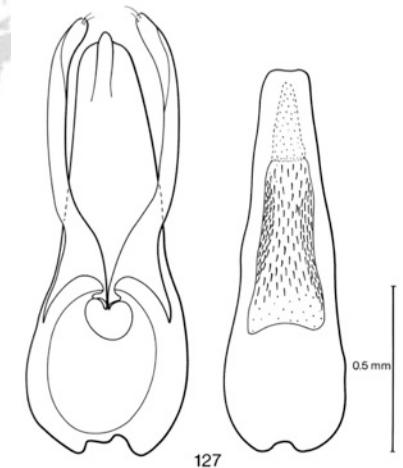
P. cascadiensis



overlap

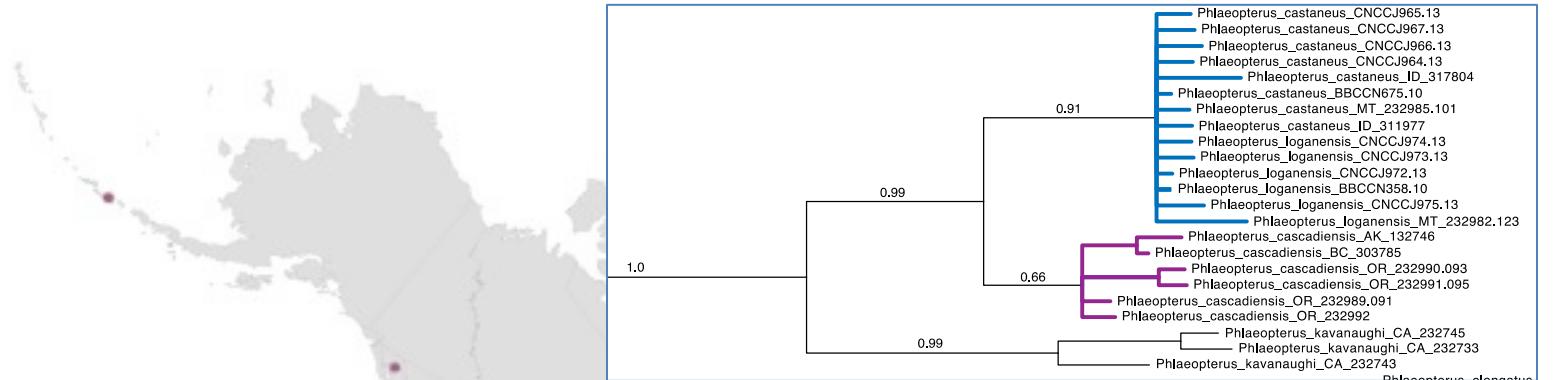


P. castaneus



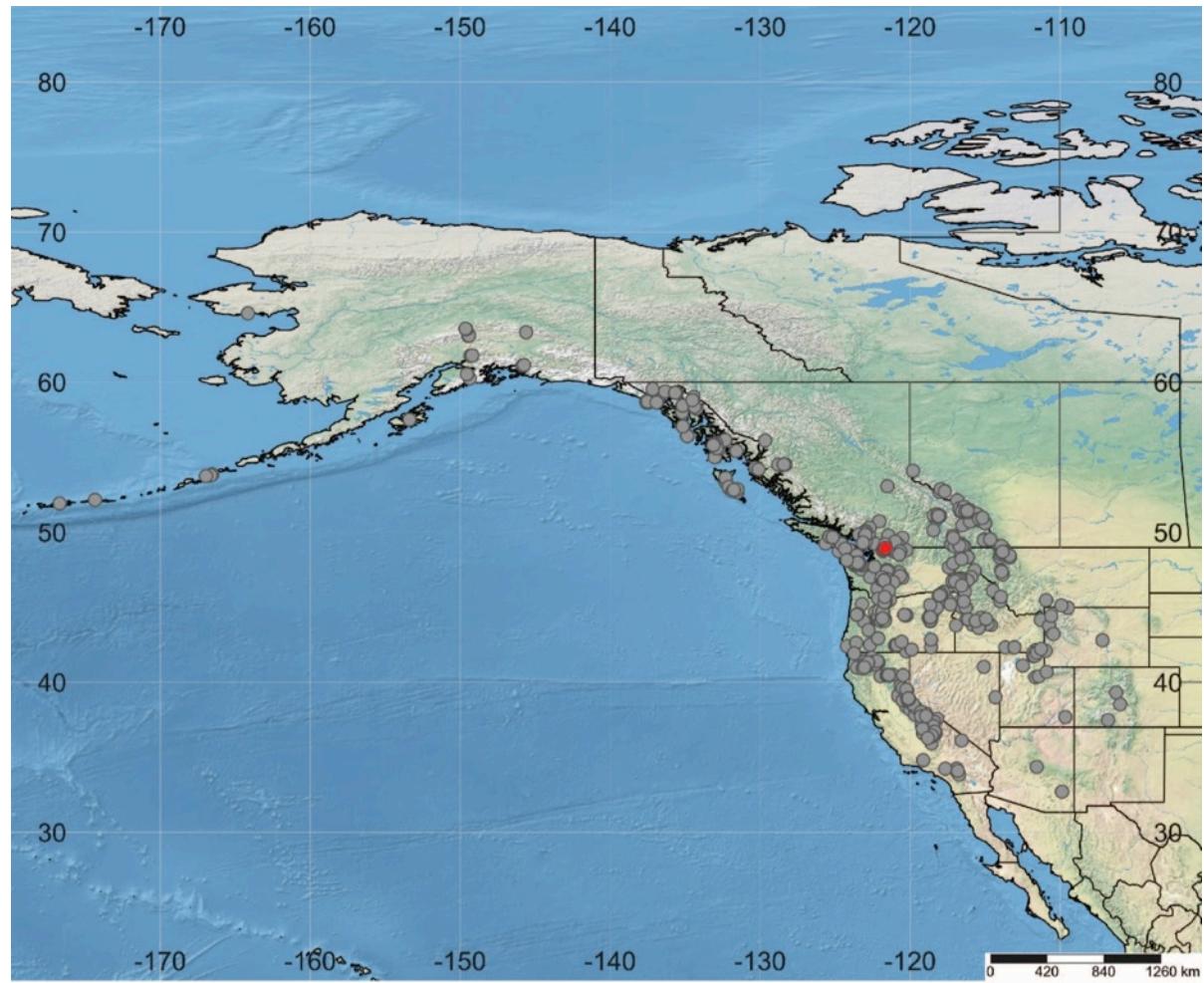
Solution:

P. castaneus castaneus, *P. castaneus cascadiensis*
P. loganensis

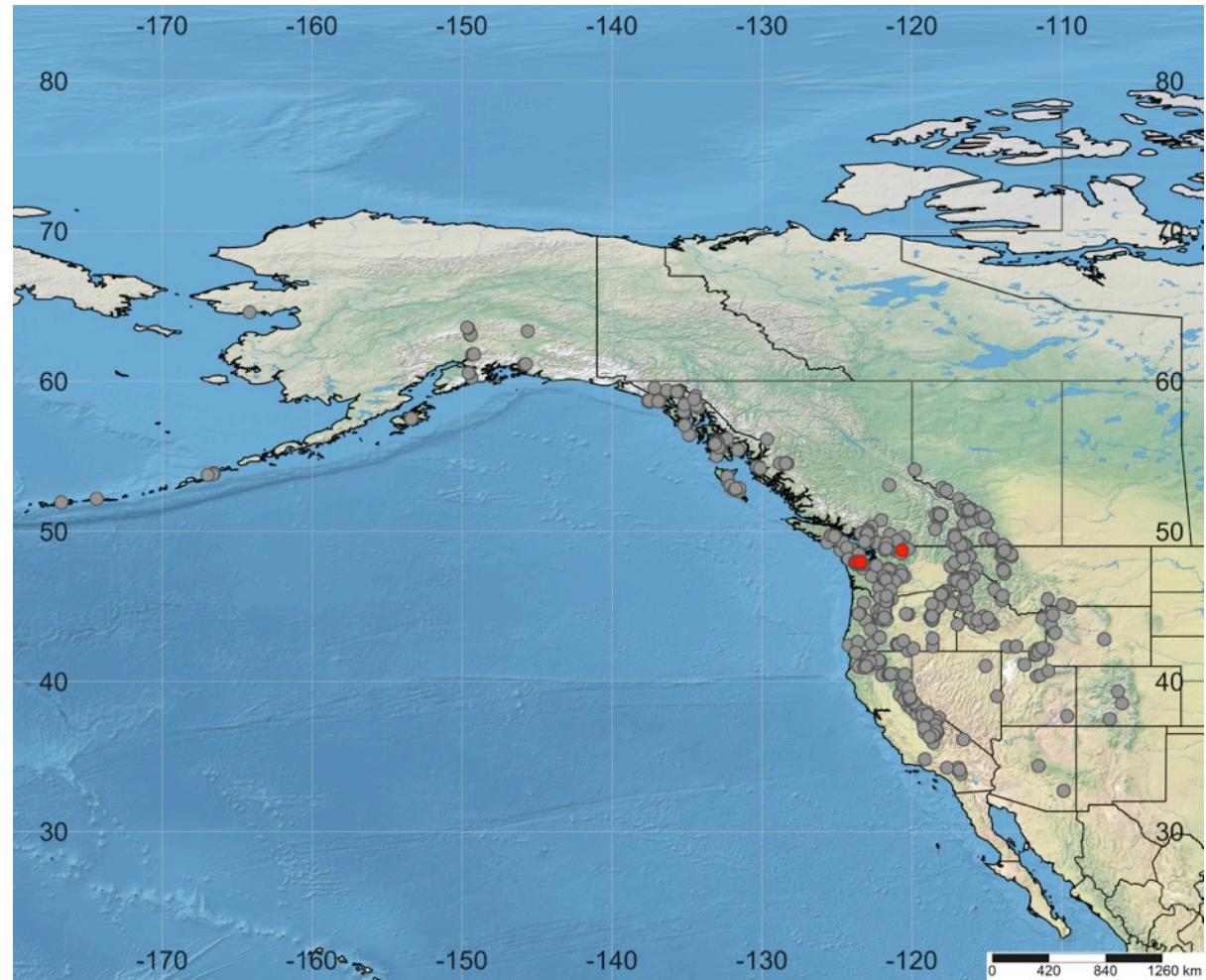


Two subspecies....
But only one shows evidence of hybridization

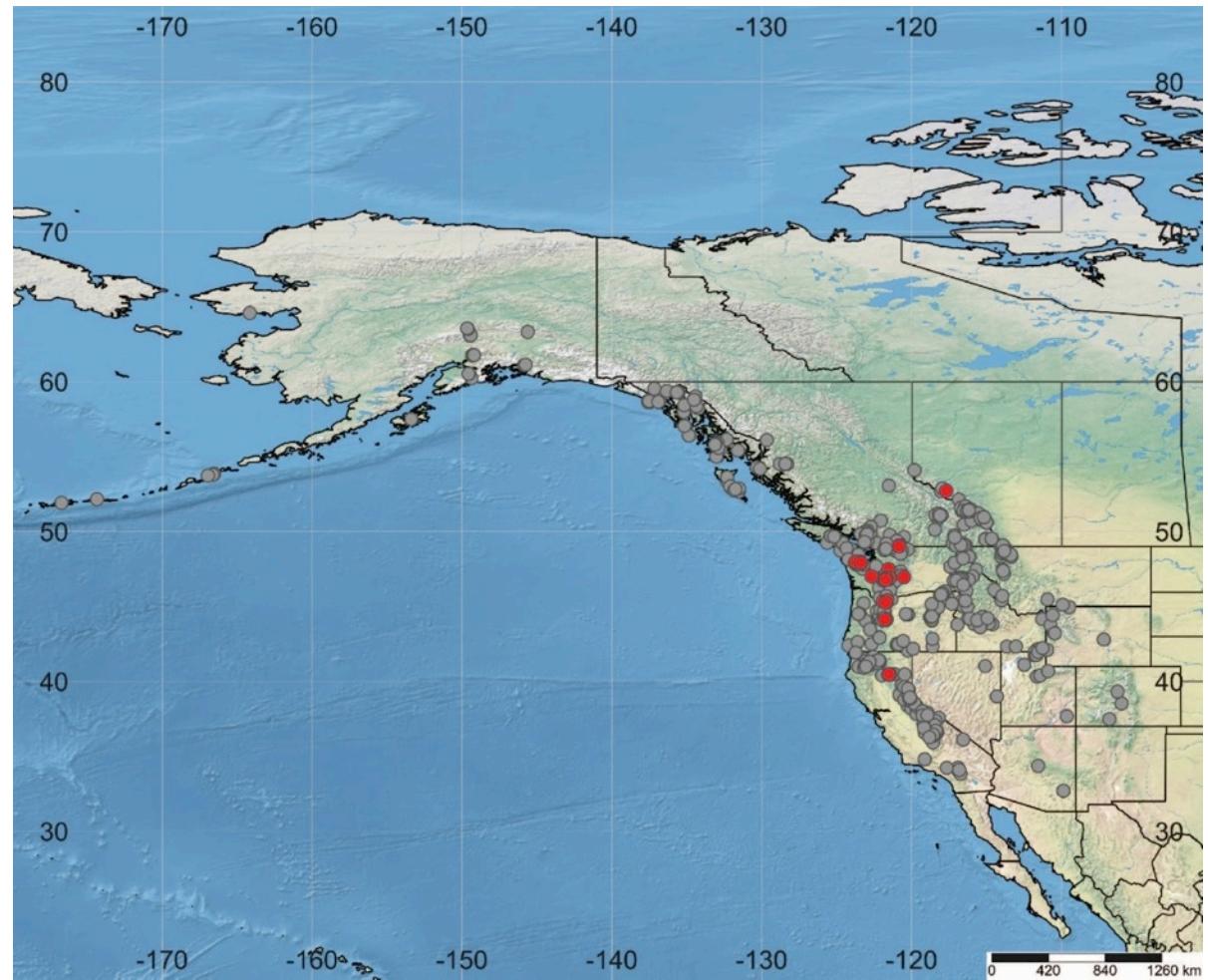
Phlaeopterus bakerensis



Phlaeopterus olympicus



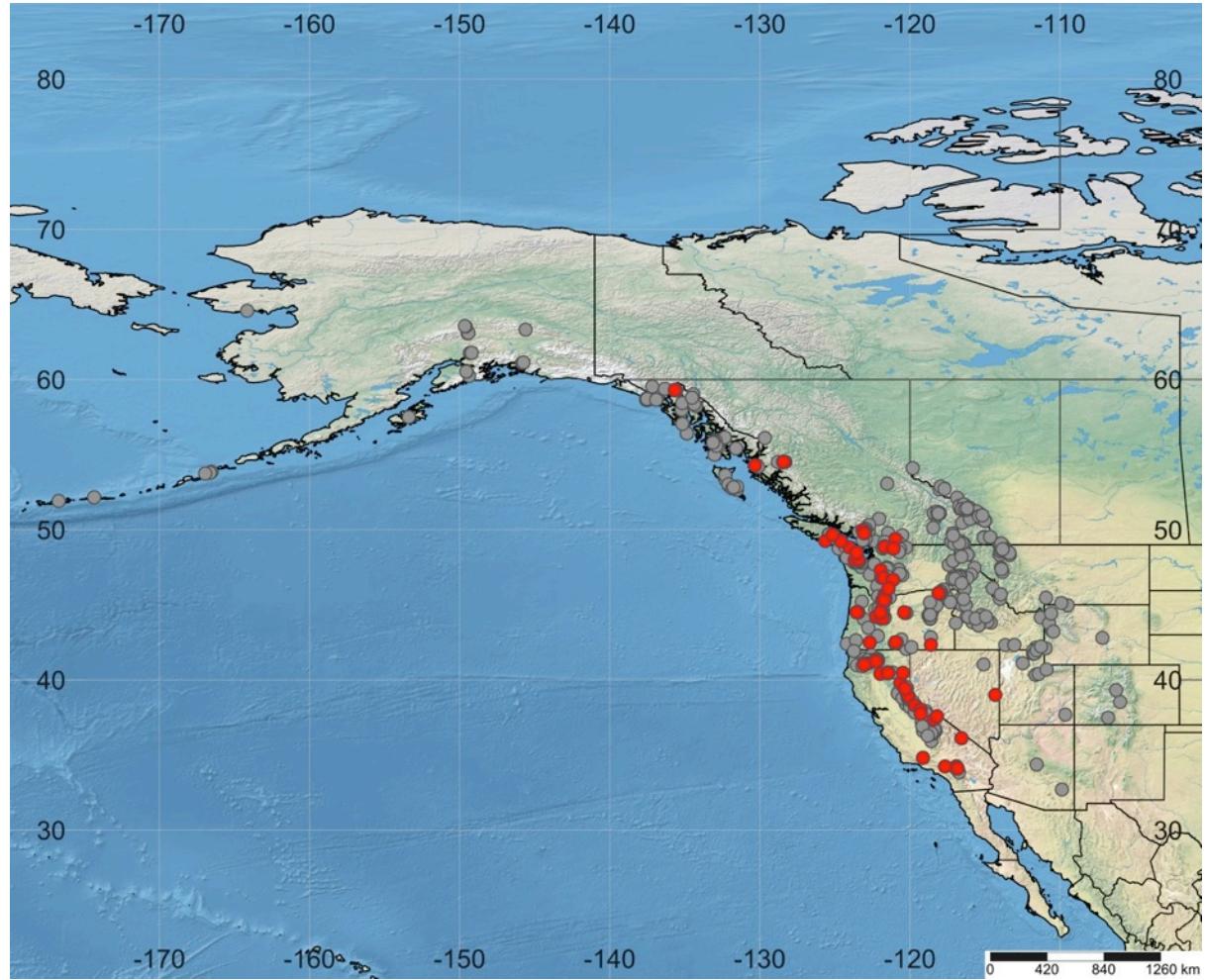
Phlaeopterus obsoletus



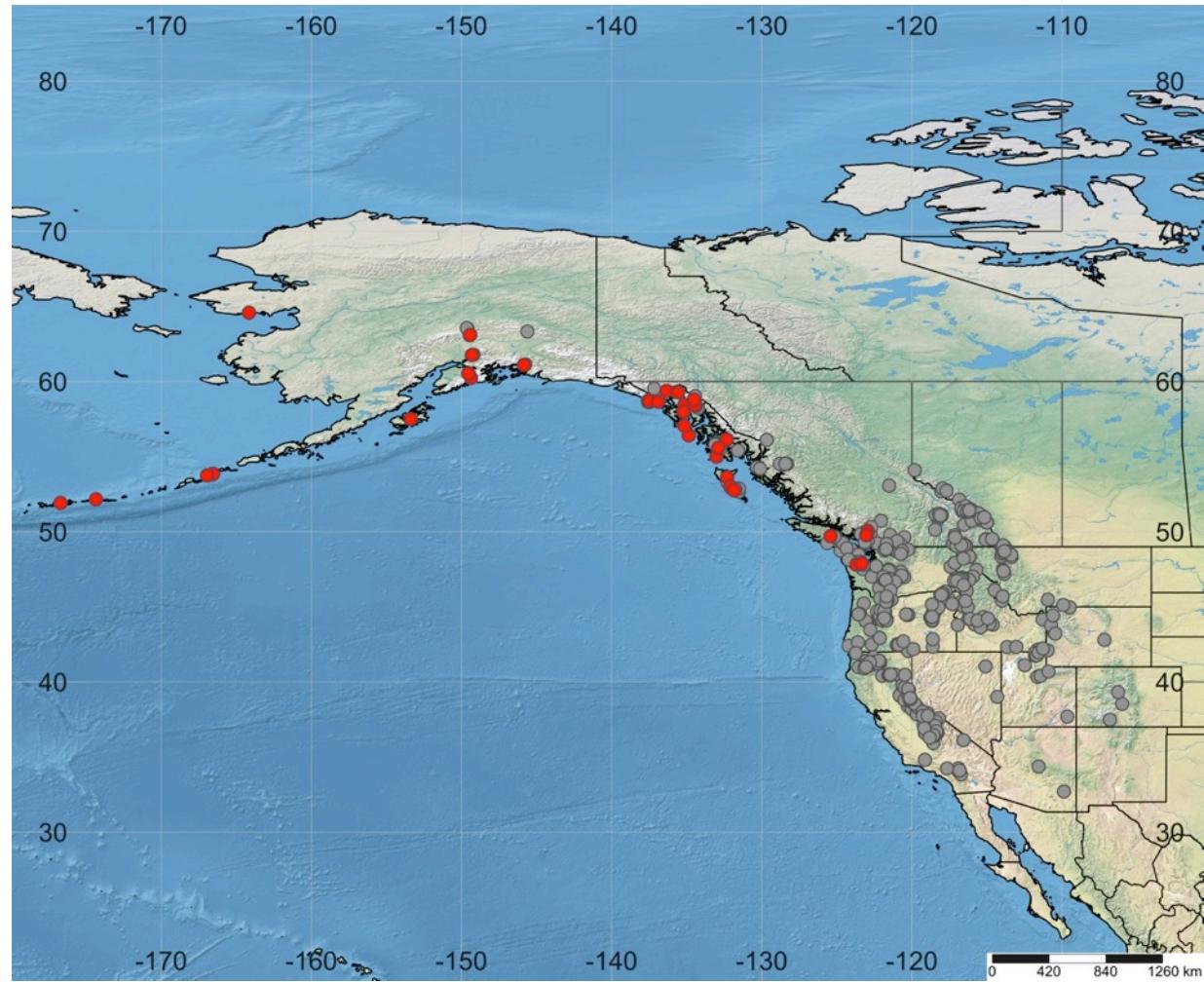
Phlaeopterus czerskyi



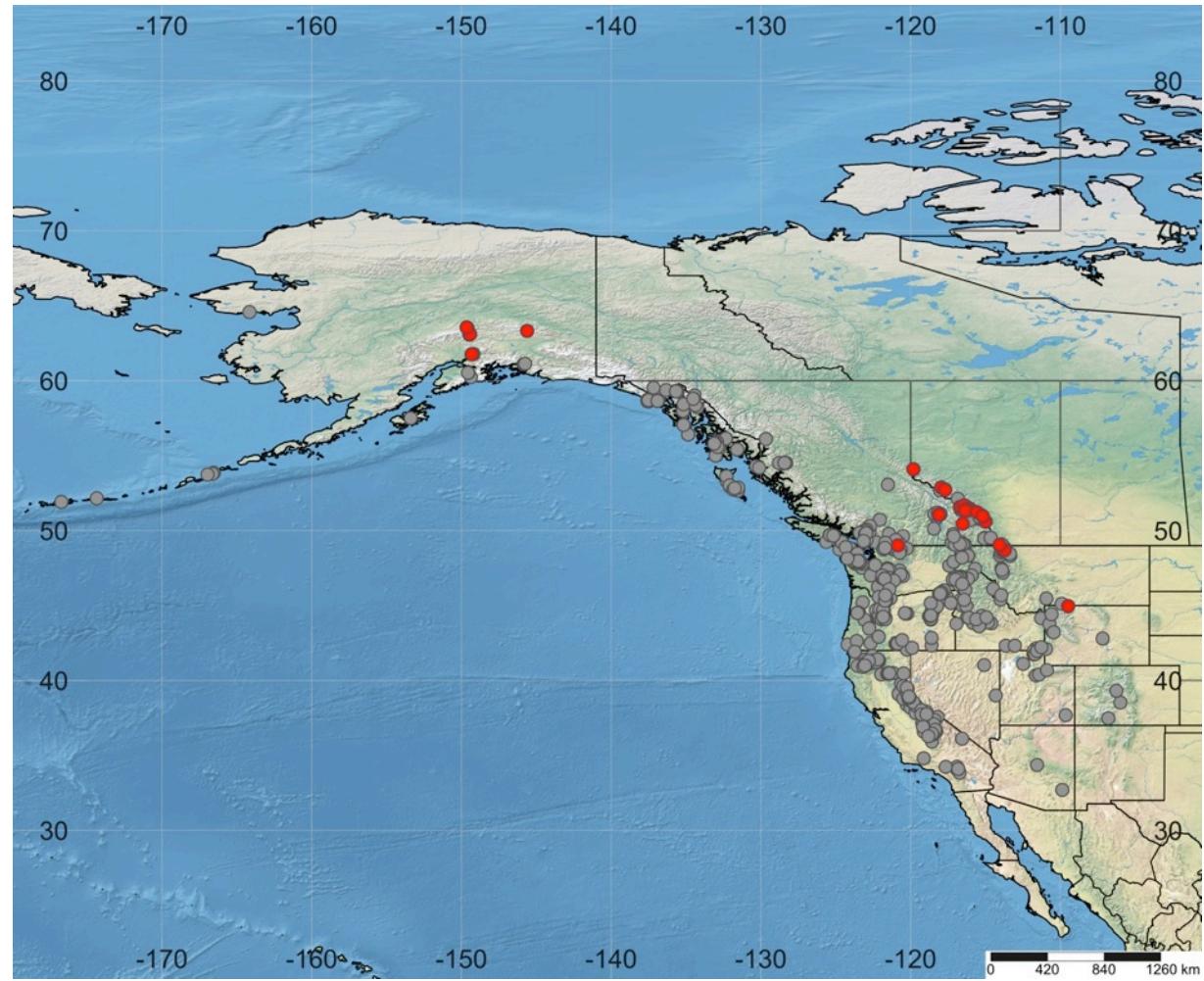
Phlaeopterus occidentalis



Phlaeopterus fusconiger



Phlaeopterus elongatus



Acknowledgements

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