

WILLOW ROSE CECIDS
via
LIFESCANNER

Matthew L. Bowser¹, Miriam D. Bowser, Ethan L. Bowser, Apphia M. Bowser, and Esther L. Bowser



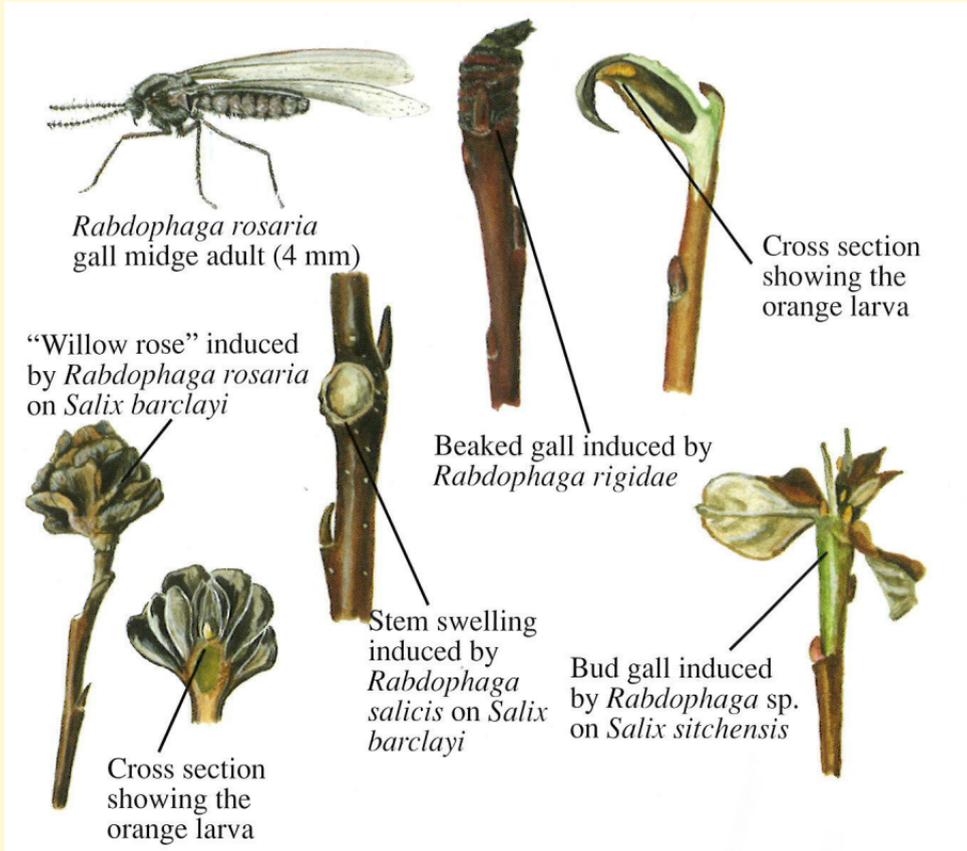
↖ Image from [1]

TENTH ANNUAL MEETING of the [ALASKA ENTOMOLOGICAL SOCIETY](#)

FEBRUARY 4, 2017 • FAIRBANKS, ALASKA

¹USFWS [Kenai National Wildlife Refuge](#), Soldotna, Alaska, matt_bowser@fws.gov

for Dominique



← Image from [2]

CONTENTS

Contents	I
A Conundrum of Willow Roses	2
To Know a Midge	5
A Plurality of Rose Cecids	14
Onward	17
Acknowledgements	18
Literature Cited	19

A CONUNDRUM OF WILLOW ROSES

OLD WORLD

Rabdophaga clavifex (Kieffer, 1891)

Rabdophaga rosaria Loew, 1850

Rabdophaga rosariella (Kieffer, 1897)

R. rosaria



NEW WORLD

Rabdophaga salicibrassicoides Packard, 1869

Rabdophaga saliscoryloides Osten Sacken, 1878

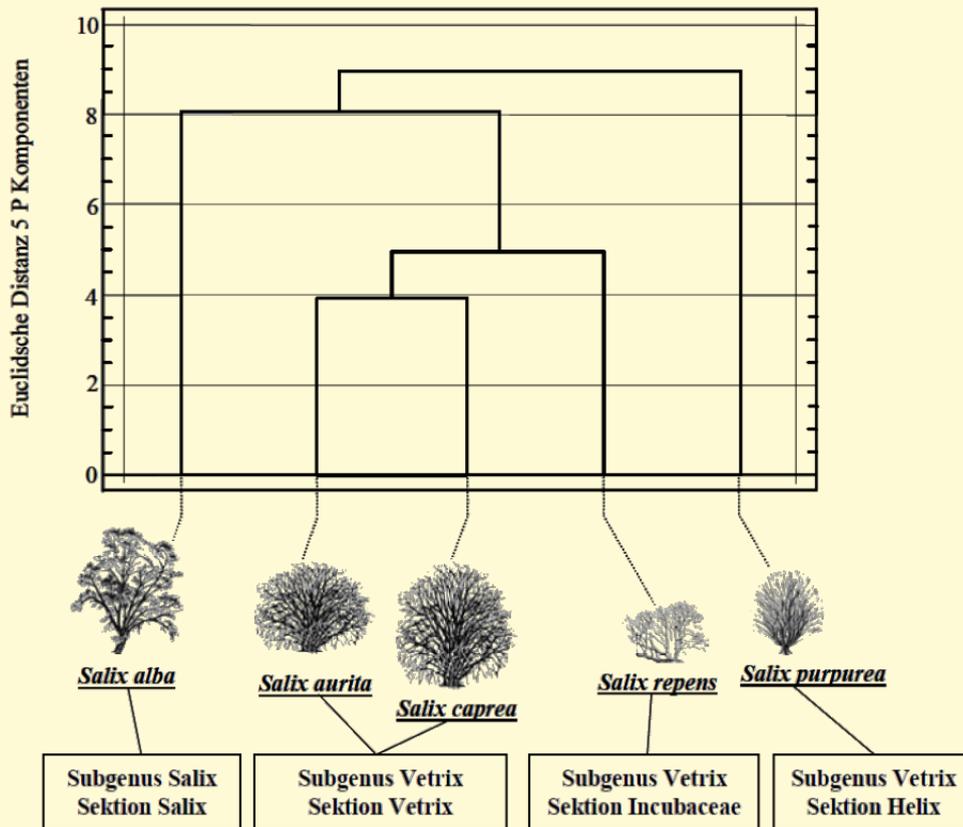
Rabdophaga salicisgnaphaloides Osten Sacken, 1878

Rabdophaga salicisrhodoides Osten Sacken, 1878

Rabdophaga strobiloides Osten Sacken, 1862

← Image from [https://commons.wikimedia.org/wiki/File:Rabdophaga_rosaria_\(Diptera_sp.\)_gall,_Arnhem,_the_Netherlands.jpg](https://commons.wikimedia.org/wiki/File:Rabdophaga_rosaria_(Diptera_sp.)_gall,_Arnhem,_the_Netherlands.jpg).

OLD WORLD *Rabdophaga rosaria*: Midge Morphometry vs. Willow Hosts [3]

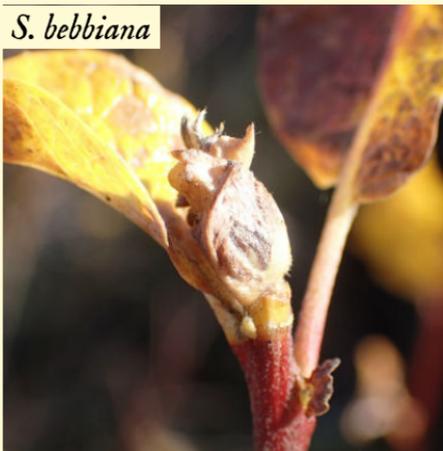


↑ Image from [3].

A CONUNDRUM OF WILLOW ROSES

ALASKA *Rabdophaga rosaria* Group: One or More?

S. bebbiana



S. barclayi



S. pulchra



S. commutata



S. sitchensis

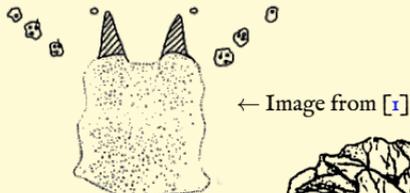


S. richardsonii

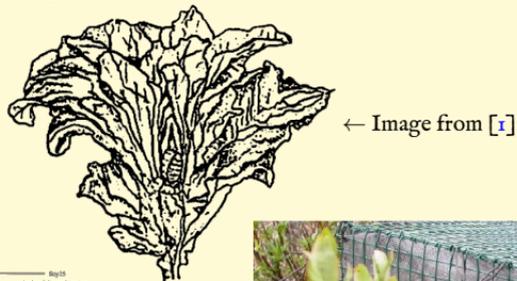


To KNOW A MIDGE

- Midge morphology [1]

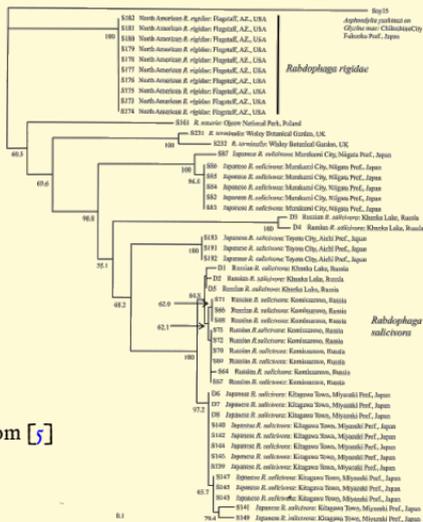


- Host species and gall characteristics [1]



- Breeding experiments [4, 6]

- Molecules [5]



↗ Image from [5]

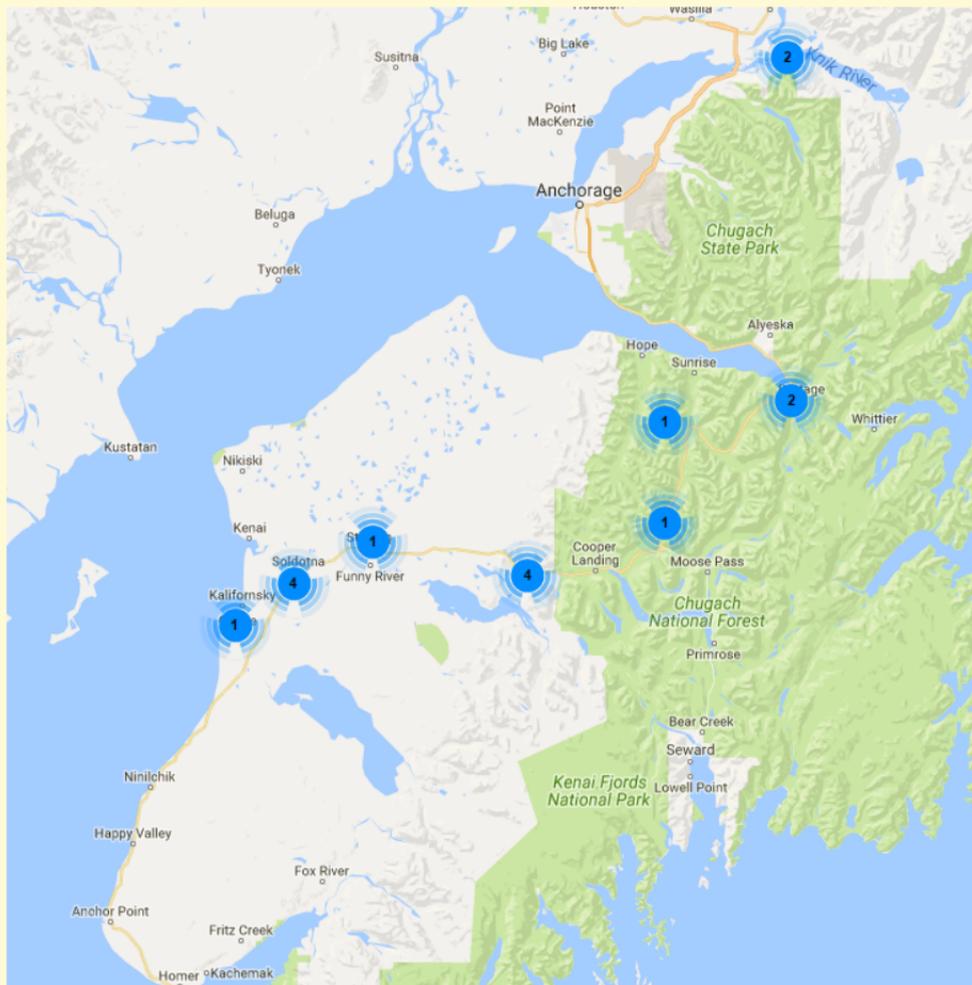


↑ Image from [4]





Localities →









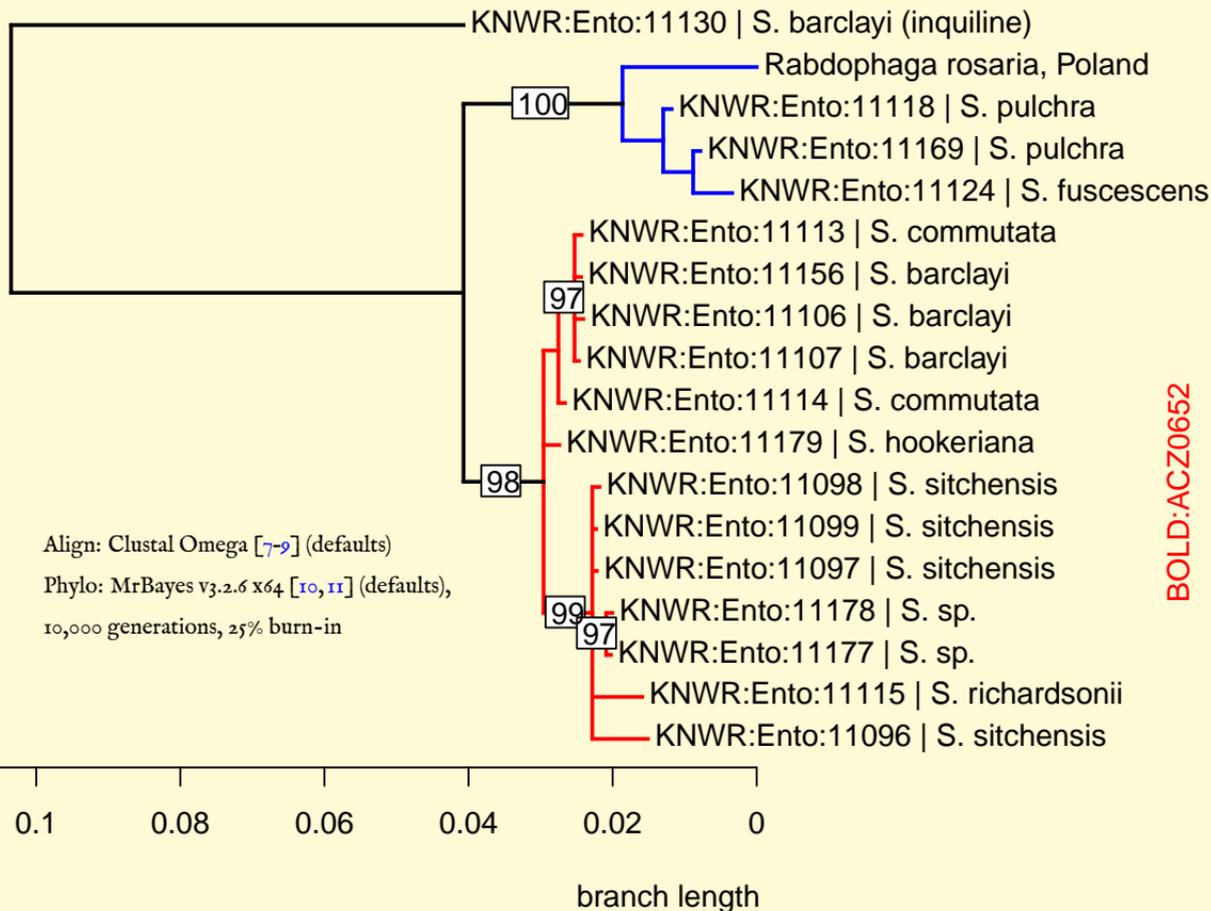


COI sequences obtained via lifescanner kits (<http://www.lifescanner.net>) ...



↑ Image from <https://pbs.twimg.com/media/CVy48OZUAAEFJ-.jpg:large>.

A PLURALITY OF ROSE CECIDS



A PLURALITY OF ROSE CECIDS

Rabdophaga rosaria group sp. BOLD:ADA9342

Close to (maybe conspecific with?) Old World *Rabdophaga rosaria*.

S. fuscescens



S. pulchra



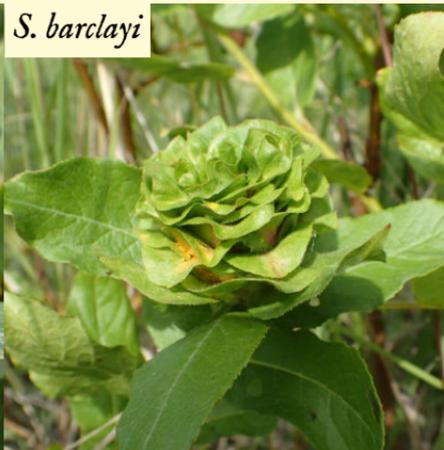
A PLURALITY OF ROSE CECIDS

Rabdophaga rosaria group sp. BOLD:ACZ0652

S. commutata



S. barclayi



← Corroborates Collet's finding that the same midge parasitizes *S. barclayi* and *S. commutata* [4].

S. hookeriana



S. sitchensis



S. richardsonii



ONWARD

- Reconcile MOTUs with existing names
- Document morphology
- Expand sampling across species and space
- Many other willow associates to explore



ACKNOWLEDGEMENTS

- Dominique Collet provided ideas, insight, and help with identification of willows.
- Funding for lifescanner kits was provided by USFWS [Kenai National Wildlife Refuge](#) and [Interior Distance Education of Alaska](#).
- Mariah McInnis and Tracy Melvin helped collect specimens.



LITERATURE CITED

- [1] Nijveldt WC, Yukawa J. A taxonomic study on *Salix*-inhabiting gall midges in Japan (Diptera, Cecidomyiidae). The Bulletin of Kitakyushu Museum of Natural History. 1982;4:23-56.
- [2] Collet DM. Willows of Southcentral Alaska. Soldotna, Alaska: Kenai Watershed Forum; 2002. Available from: <http://web.acsalaska.net/~kenaiwatershed.forum/willowguide.html>.
- [3] Amendt J. Taxonomie, Biologie und Feindartenkomplex ausgewählter Gallmückenarten (Diptera: Cecidomyiidae) auf Weiden (*Salix* spp.) [PhD thesis]. Goethe University. Frankfurt, Germany; 2003. Available from: <http://publikationen.uni-frankfurt.de/frontdoor/index/index/docId/684>.
- [4] Collet DM. Rearing experiment to determine the willow host range of *Rabdophaga* spp. in Alaska. Newsletter of the Alaska Entomological Society. 2010;3(1):9-11.
- [5] Sato S, Yukawa J. Resurrection of *Rabdophaga salicivora* Shinji (Diptera: Cecidomyiidae), a Japanese gall midge formerly misidentified as a North American species, *Rabdophaga rigidae* (Osten Sacken), with observations on the phylogenetic relationships of its populations in Japan and the Russian Far East. Entomological Science. 2006;9(4):423-434. doi:10.1111/j.1479-8298.2006.00188.x.
- [6] Smith FF, Webb RE, Argus GW, Dickerson JA, Everett HW. Willow beaked-gall midge, *Mayeriella rigidae* (Osten Sacken), (Diptera: Cecidomyiidae): differential susceptibility of willows. Environmental Entomology. 1983;12(4):1175-1184. doi:10.1093/ee/12.4.1175.
- [7] Goujon M, McWilliam H, Li W, Valentin F, Squizzato S, Paern J, et al. A new bioinformatics analysis tools framework at EMBL-EBI. Nucleic Acids Research. 2010;38(suppl_2):W695-W699. doi:10.1093/nar/gkq313.
- [8] Sievers F, Wilm A, Dineen D, Gibson TJ, Karplus K, Li W, et al. Fast, scalable generation of high-quality protein multiple sequence alignments using Clustal Omega. Molecular Systems Biology. 2011;7(1):539. doi:10.1038/msb.2011.75.
- [9] McWilliam H, Li W, Uludag M, Squizzato S, Park YM, Buso N, et al. Analysis Tool Web Services from the EMBL-EBI. Nucleic Acids Research. 2013;41(W1):W597-W600. doi:10.1093/nar/gkt376.
- [10] Huelsenbeck JP, Ronquist F. MRBAYES: Bayesian inference of phylogenetic trees. Bioinformatics. 2001;17(8):754-755. doi:10.1093/bioinformatics/17.8.754.
- [11] Ronquist F, Huelsenbeck JP. MrBayes 3: Bayesian phylogenetic inference under mixed models. Bioinformatics. 2003;19(12):1572-1574. doi:10.1093/bioinformatics/btq180.